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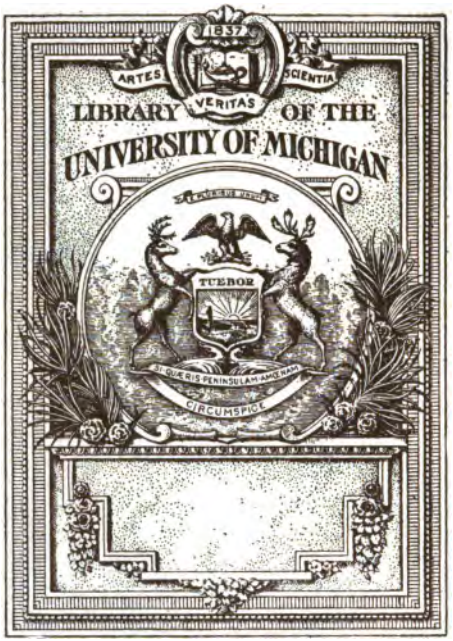

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Royal Society of arts. London,

TRANSACTIONS

OF THE

SOCIETY

INSTITUTED AT LONDON,

FOR THE

ENCOURAGEMENT

OF

ARTS, MANUFACTURES, and COMMERCE;

WITH THE

PREMIUMS offered in the YEAR 1793.

VOL. XI.

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M.DCC.XCIII.

PREFACE.

THIS Volume, like the preceding ones, will be found divided into the ſeveral heads under which the buſineſs of the Society is conducted: and in the Claſs of Agriculture, are inſerted ſeveral papers which, it is preſumed, will prove of very conſiderable utility; as, a mode of preſerving young Plantations from the depredations of Hares, Rabbits, &c.—a full account, verified by actual experiment, of the advantage attending a proper mode of Pruning Orchards; with a method of preparing a medicated Tar for preventing the injuries ariſing to the wounded parts of the trees, from all kinds of inſects. Should the method here

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recommended be found to anſwer the general purpoſe of improving the huſbandry of Orchards through the kingdom, as is the expreſs wiſh and belief of the author; the advantages reſulting from this communication will prove of infinite benefit to the Community.

This ſeſſion has produced to the Society four Claimants for the Premium offered for diſcovering the comparative advantage of the Drill and Broad-caſt Culture of Wheat, all which have been judged worthy of Rewards; and from them the Public will be enabled to form an opinion on what ſoils, and under what circumſtances of culture and ſituation, the drill or broad-caſt method is likely to prove moſt advantageous. The ſame may be ſaid of the culture of Turneps, on which alſo a Paper is inſerted.

A Letter from Mr. Hollins, of Berriew, whoſe papers have already been publiſhed in the Eighth and Ninth Volumes of theſe Tranſactions, is here inſerted; which may a ſup-

be conſidered as a ſupplement to thoſe already printed on the ſubject, and ſeem to prove the doctrine therein advanced, on the preſerving crops of Potatoes from the diſeaſe called the Curl, to be well founded.

Some Letters on the advantages of feeding Cattle with Potatoes, and Stall-feeding Horſes, printed in the following Sheets, will throw freſh light on thoſe ſubjects, and ſpread the knowledge of the benefits ariſing therefrom through the kingdom.

The cultivation of that uſeful drug, the Rheum Palmatum, or True Rhubarb, having extended itſelf to many parts of this kingdom, Rewards were this year adjudged to Mr. Jones, of Fiſh-ſtreet Hill, and Mr. Halley, of Pontefract, whoſe Papers are inſerted in this Volume. It was with much ſatisfaction the Society obſerved that ſome of the Rhubarb received from Mr. Halley, was perfectly dry, and cured in a manner ſuperior to any hitherto produced for their inſpection; and as it is well known that the plant thrives luxuri-

antly in this Iſland, and that the only obſtacle to its becoming an article of conſequence, both for home conſumption and exportation, was the ſuppoſed difficulty of curing it properly: that difficulty being obviated, there ſeems every reaſon to believe Rhubarb may become an article of very conſiderable importance to this country.

The improving the Waſte Lands of this Kingdom has ever been an object of ſerious conſideration to the Society; and it is with particular pleaſure the account of Mr. Haſſal's Improvements has been received; as the peruſal of it will probably afford ſome very uſeful information on that ſubject.

The preſerving Seeds, when ſown, from the depredation of Mice and other Vermin, is a matter of great importance; and the method propoſed by Mr. Browne may well deſerve the attention of the gardener, whoſe crops are frequently loſt from this cauſe.

Mr.

Mr. M'Dougale's Hoe, of which (at work) a view is prefixed to this Volume, appeared, on trial, to exceed any inſtrument of the kind hitherto produced.

Notwithſtanding there is good reaſon to believe that the art of ſpinning a number of threads by one perſon, at one time, took its riſe from the Premiums offered by this Society (ſee Preface to Vol. I. of theſe Tranſactions), yet the improvement of the common Spinning-wheel has not been neglected; and this year a very advantageous improvement having been produced by Mr. Antis, of Fulneck, a Reward was given to him for it; and a Plate and Deſcription of the Machine inſerted in this Volume.—Another, which, though not properly a part of the Spinning-wheel, is connected with it, has alſo been produced this year: this is a method of winding thread into balls during the ſpinning, whereby the time loſt in winding, according to the preſent mode, is ſaved, without any ſenſible additional labour to the ſpinner. A Plate of this contrivance would have been

inſerted in this Volume; but, as the Society have thought fit to offer a premium for the beſt Drawing, by young perſons, of this Machine, it has been judged improper the print ſhould now appear; but may probably make part of ſome future publication.

The two fore-mentioned Machines are inſerted under the head of Manufactures; for though, with regard to their conſtruction, they might be conſidered under the Claſs of Mechanicks, yet, in their application and effect, they are more properly arranged, as tending to improve the Manufactures of the Country.

Under the head of Mechanicks will be found, in the following ſheets, an Account and Deſcription of an improved Gudgeon, for the Upright Shafts of Mills; an ingenious contrivance, with a Plate, for equalizing the Water on Water-wheels; a Crane with a double Gib, by which large Weights may be depoſited immediately from the Crane, on the ſpot where they are intended to be laid; a complete Deſcription,

tion, with a Plate, of a method effectually to ſecure a Ship's Rudder, by Capt. Edward Pakenham, to whoſe ingenuity and attention this Country is already ſo much indebted.

The encouragement given by the Society to the taking Whales by the Gun Harpoon, has been the means of eſtabliſhing that advantageous practice; and every contrivance that may forward that buſineſs, has uniformly met their approbation and reward. This year there has been produced to them a contrivance, by which the principal objections to the uſe of the Gun Harpoon will be overcome; and as Mr. Bell has given unequivocal proofs of his ingenuity and abilities in his profeſſion (ſee Vol. X. p. 203), there is every reaſon to believe what he has now communicated will redound to his own credit, and anſwer very uſeful purpoſes in the Whale Fiſhery.

The frequent and melancholy accidents that happen, in Walking-wheel Cranes, by

by the weight ſuſpended overcoming the men in the Wheel, the Society have given ſeveral Rewards for the diſcovery of ſome certain method of preventing thoſe misfortunes: and this year a Bounty has been voted to an ingenious perſon for his contrivance to anſwer that purpoſe.

Under the Claſs of Colonies and Trade, will be found a Letter from the ingenious and learned Dr. Dancer, of Jamaica, on the ſubject of Cinnamon and ſome other plants, the produce of that Iſland. The Society have this year been favoured with a Letter from Dr. Anderſon, Superintendant of the Botanic Garden in St. Vincent's, incloſing a catalogue of the plants growing in that garden, which, though not thought proper for inſertion in this Volume, is preſerved in the Society's Library for the inſpection of the curious.

The Silver Medal has this year been voted to Mrs. Anſtey, now reſident at Madras. This lady, who, in the war with Hyder Ally,

Ally, having retired to Ceylon, brought from thence, on her return, two plants of the Cinnamon-tree, which, by letters from that ſettlement, appear to have produced ſo many young trees as in time promiſe to ſupply this country with a large quantity of that valuable ſpice.

The principal Papers to be found in this Volume having been thus ſummarily deſcribed, it may not be improper to remark that the preſent flouriſhing ſtate of the Society has enabled them to conſider of propoſing to the Public ſome new Premiums, as well as increaſing, in many caſes, the pecuniary Rewards already offered; all which the reader will readily perceive.

Among the new Premiums will be found one for planting Oſiers, which took its riſe from letters ſent to the Society by the makers of baſkets for fruit, &c. wherein it is ſtated, that from ſeveral cauſes (among which is the want of importation of the rods from France, from whence many uſed

to be brought), Oſiers were become ſo ſcarce in England, as not only very much to enhance the price of thoſe articles in the making of which they are uſed, but had alſo been the means of throwing a number of induſtrious people out of employ: this, therefore, in a double ſenſe, became a proper object of the Society's attention.

Under the head of Agriculture will alſo be found a Premium offered for diſcovering an effectual method of preventing and curing the ill effects of the Fly on Sheep. When the miſchiefs ariſing from that inſect are conſidered, the utility of ſuch a diſcovery will be at once fully obvious.

Under the head of Chemiſtry, two new Premiums are offered, the one for diſcovering a method of clearing Feathers from the Oil that cauſes their diſagreeable ſcent in furniture; and the other, for a mode of glazing the ordinary kinds of Earthen Ware.

In Mechanicks, it has been judged proper to diſcover, by the offer of a Premium, an

an eaſily portable Machine for loading and unloading goods. And under the Claſs of Colonies and Trade, a conſiderable Reward is offered for forming a Botanic Garden in the Bahama Iſlands, for the purpoſe of encouraging the growth of Tropical plants in thoſe Iſlands.

As it is the profeſſed purpoſe of the Society's Inſtitution to encourage, by every means in their power, the introduction of new and uſeful articles, as well as the improvement of ſuch as are already known, that may tend to advance the Arts, Manufactures, and Commerce, of this Kingdom; the ingenious of both ſexes are again invited to produce to the Society whatever may promote that end, fully aſſured that all works of utility will here meet a reward, and afford to the Authors the pleaſing ſatisfaction of having contributed to the increaſe of the honour and riches of their native Country.

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PAPERS

IN

AGRICULTURE.

AGRICULTURE.

THE Thanks of the Society were given to WILLIAM PATTENSON, of Ibornden, in Biddenden, Kent, Eſq. for the following Communication relative to the preſerving young Plantations of Trees from the Injuries occaſioned by Hares, Rabbits, &c. Should any Perſons make trial of the method here propoſed, an account of the effect will be highly acceptable to the Society.

SIR,

I BEG you will be ſo kind as to make my moſt reſpectful acknowledgements to the Society, for their civility in favouring me with the tenth volume of their Tranſ-

actions; and if the following method of preſerving young Plantations from being injured by Hares or Rabbits, ſhould be acceptable, I ſhall be happy in having communicated it; and am,

SIR,

With great reſpect,

Your moſt obedient ſervant,

WM. PATTENSON.

Ibornden,
Oct. 6, 1792.

A Method to prevent Hares and Rabbits barking young Plantations.

HARES, rabbits, and rats, have a natural antipathy to tar; but tar, though fluid, contracts, when expoſed to the ſun and air for a time, a great dryneſs, and a very binding quality; and, if applied to trees in its natural ſtate, will occaſion them to be bark-bound. To remove this difficulty,

culty, tar is of ſo ſtrong a ſavour, that a ſmall quantity, mixed with other things in their nature open and looſe, will give the whole mixture ſuch a degree of its own taſte and ſmell as will prevent hares, &c. touching what it is applied to.

Take any quantity of tar, and ſix or ſeven times as much greaſe, ſtirring and mixing them well together; with this compoſition bruſh the ſtems of young trees, as high as hares, &c. can reach; and it will effectually prevent their being barked. I believe, if a plantation of aſh (which they are very fond of) were made in a rabbit-warren, this mixture would certainly preſerve it.

They do great miſchief amongſt flowering ſhrubs, are particularly fond of Spaniſh broom, ſcorpion-ſenna, and ever-green cytiſus. I have had thoſe ſhrubs eat down to a ſtump; but, as the mixture cannot be conveniently applied to them, I have encloſed their branches with new tar twine by putting it ſeveral times round the ſhrub,

which has had the deſired effect; tar twine, by being expoſed to the air and rain, will loſe its ſmell; conſequently, muſt be renewed as occaſion requires; but the mixture is always to be preferred, where it can be uſed.

THE

The SILVER MEDAL and THANKS of the Society were voted to THOMAS SKIP DYOT BUCKNALL, Eſq. for the following Obſervations relative to the Pruning of Orchards.

SIR,

THE great improvements this country has received by the inſtitution of the Society for the Encouragement of Arts, Manufactures, and Commerce, giving an emulation to gentlemen to come forward, and communicate whatever may have a tendency to benefit the public, make me deſirous of laying before the Society ſome hints on the pruning Orchards, which ſubject appears to me to have been greatly neglected; but is capable of being methodiſed into a ſyſtem to ſuit the meaneſt capacity, and does not require the ſkill of a gardener; being reducible to a few general heads, concentrating

in the principle of making every tree in an orchard healthy, round, large, and beautiful.

How far the hints may be worthy of the patronage of the Society, I cannot ſay; but ſhould feel myſelf highly gratified, if they could gain a place in their uſeful publications; for by that means they will become known in the country, and, if put in practice, would in great meaſure remove from the London markets the quantities of ſpeckled and ſtunted fruits conſtantly ſeen there; which in a great degree ariſes from the trees being overloaded with wood, that, obſtructing the rays of the ſun, cauſes an almoſt perpetual vapour, the cold of which, in the ſpring, ſtunting the fruit in the firſt growth, the evil muſt remain, let the weather ſet in ever ſo fine afterwards.

Every coſtermonger knows it is the fine fruit which ſells the orchard; for, of the inferior ſorts, many buſhels do not produce above

above a penny to the grower, after the expences of gathering and bringing to market are borne. The following experiment was made in the ſpring and autumn of 1790, on ſix acres of land fully planted with apples and cherries, on an old hop-ground, at Sittingbourne, in the county of Kent; and although the leaſe had eighteen years to run, I put myſelf to near 10l. expence, merely to ſhew the tenant what could be done, and which has fully anſwered the intended purpoſe.

If this has the honour of meeting with approbation, it may give an emulation in the country upon a ſubject almoſt overlooked, yet which is of eſſential concern; and if by example I can prove the preſent method erroneous, a little experience will inſenſibly lead to perfection; and then the practice will become general over the kingdom, and very properly comes under the article Agriculture; the various improvements of which owe their riſe to uſeful hints, ſtimulated

mulated by the encouragement of the Society.

I ſubſcribe myſelf,

SIR,

Your moſt humble ſervant,

THOS. SKIP DYOT BUCKNALL.

Conduit-ſtreet.

Mr. MORE.

SIR,

I NOW trouble you with a ſhort recital, for the inſpection of the Society for the Encouragement of Arts, Manufactures, and Commerce, on the pruning Orchards. I ſhall hereafter be aſſiduous in collecting uſeful hints from real practice, to throw the HUSBANDRY of ORCHARDS under proper regulations, that the ſubject may become worthy

worthy the attention and patronage of the Society.

I am, SIR,

Your moſt humble Servant,

THOS. SKIP DYOT BUCKNALL.

Candnit-ſtreet.

Mr. MORE.

Obſervations on pruning Orchards.

THE bark of trees, properly conſidered, conſiſts of three diviſions: the outer, rough; the middle, ſoft and ſpungy; the inner, a whitiſh rind, being that which joins the bark to the wood; and this laſt is ſuppoſed to contain the liquid ſap. It is conſtantly obſerved, that when the ſtem of the tree grows too faſt for the bark, it cauſes blotches and lacerations; which evil is properly avoided by ſcoring the bark with a ſharp knife: but care ſhould be taken not to cut through the whitiſh rind before mentioned; for that heals very difficultly, generally ulcerates, and by being

being cut through, gives the inſects * an opportunity of getting between the wood and the bark, where they are very deſtructive.

Any ſurgeon knows that a wound extending to the fine membrane, covering the bones of the human body, requires much more ſkill to cure than a fleſh wound; and the caſe is ſimilar.

Pruning is an important article with regard to the health of trees, and their bearing; and if judiciouſly done, they will come into bearing ſooner, and continue in vigour for nearly double their common age: but the ſyſtems of pruning are ſo wordy, that the common farmer cannot underſtand them, and the gardener thinks the orchard beneath his care, for which reaſon it is left to nature and the winds; for the farmer,

* Inſects, ſuch as ants, earwigs, and many ſpecies of millepedes, with numerous microſcopic creatures, of which I know no name; but each of which obſtruct the healing of the wounds, by their conſtant eating and fretting the tender bark.

farmer, afraid of doing wrong, never troubles himſelf about it, unleſs, ſeeing a branch half broken, he takes his bill and knocks it off, perhaps four or five inches from the trunk, leaving an unſightly ſtump. Do not imagine this is intended as any reproach; for there are no ſet of men who ſpend their time more judiciouſly in their vocation, but they cannot run into ſpeculations; if they did, little rent would be paid. I give no attention to fruit branches and wood branches, as being unneceſſary in the preſent inſtance; and beg once for all, that no branch ſhall ever be ſhortened, unleſs for the figure of the tree, and then conſtantly taken off cloſe at the ſeparation, by which means the wound ſoon heals. The more the range of the branches ſhoot circularly, a little inclining upwards, the more equally will the ſap be diſtributed, and the better will the tree bear; for, from that circumſtance, the ſap is more evenly impelled to every part. Do not let the ranges of branches be too near each other; for remember, all the fruit and

the

the leaves ſhould have their full ſhare of the ſun; and where it ſuits, let the middle of the tree be free from wood, ſo that no branch ſhall ever croſs another, but all the extreme ends point outwards.

The beſt compliment your neighbour can make is, that your trees are handſome, but too thin of wood: be it ſo; and you may ſay, True, Farmer; but I have the beſt price at market, and that will always be the ſure teſt of perfection.

My tenant, Mr. Boulding, planted the orchard in 1772: being on a rich ſoil, it throve ſurpriſingly. That vigorous growth occaſioned the after decay; for the wind having great power over them, ſplit them down; the ladders, in gathering, broke them; the wood being ſoft, many cauſes concurred to injure them; and the injudicious manner in which the lacerations were taken off, added to the evil; for there generally follows gum from a wound, which being ſweet in fruit-bearing trees, the

und

wound becomes filled with vermin, which obſtructs the healing, by their conſtantly eating and fretting the young bark.

Being informed of the ſituation the orchard was in, I went down in the ſpring of 1790, and found the branches ſo intermixed and entangled together, that in many places they had cut each other nearly half through, cauſing wounds and blotches; which, on the return of the ſap in the ſpring, always affects the leaves, by inclining them to curl, and is a proof that the ſap is vitiated.

Having examined the circumſtances, I told the tenant I would come down in the autumn, when proper perſons muſt be found to execute the buſineſs, and we would reinſtate the orchard, and bring it to its former ſplendor; for it ſhould be obſerved, the orchard uſed to be much admired. Accordingly, I went the firſt Tueſday in November, and for two hours walked over the ground with the men, inſtructing

ſtructing them what I would have done, that we might begin the next morning, work with ſpirit, and loſe no time. We had ſaws, bills, and knives prepared on purpoſe; and, though I am a good hand myſelf, ſoon perceived neither of us could cut true enough with a bill to take off the branch, without leaving a ſtump or improper wound; for it is eſſentially neceſſary that every branch ſhould be cut perfectly cloſe and ſmooth; for which reaſon we took the ſaws, and afterwards ſmoothed the place with a knife. My ſervant's buſineſs was, with a painter's bruſh to ſmear over the wounds with a medicated tar hereafter deſcribed.

It is impoſſible the bark can grow over a ſtump, becauſe there is no power to draw the ſap that way; for which reaſon always cut a little within the wood. I was conſtantly directing to cut quick, cloſe, and ſmooth: we kept together, firſt walked round the tree; then I pointed out every branch that came near to the ground

or

or had received any material injury, or where the leaves were much curled; for where the leaves curl, the fruit is always ſpecky; and every branch, which had the leaſt tendency to croſs the tree or run inwards, was taken off. Then we gave a little attention to the beauty of the head, leaving all the branches as nearly equidiſtant as poſſible: next we examined if there were any remaining blotches, opening or ſcoring them with the knife; and where the bark was ragged from any laceration, paring it gently down till we came to the live wood. Each of theſe was touched over with the medicated tar.

Having gone thus far, we ſhould have rubbed off the moſs and ſcored the trees: but I had not time for that part of the buſineſs; I only wiſh I had ſecured a perſon on purpoſe. In the cutting we followed the ſurgeons rule; go to the quick, but do not wantonly make any wound larger than neceſſary.

We ſometimes had our doubts whether a particular branch ſhould be taken off. The idea I brought it under was this: conſider whether it will be in the way three years hence; if it will, the ſooner it is off the better.

When trees are much thinned, they are ſubject to throw out great quantity of young ſhoots in the ſpring, which I requeſted the tenants to be particularly careful to rub off: it is neceſſary that they be rubbed, and not cut; for cutting increaſes the number.

As our work drew near a concluſion, one of the tenants ſaid, We underſtand our buſineſs ſo well, that I wiſh we had another job; upon which my ſervant obſerved, You had better keep in your own pariſh, for the people are much diſſatisfied. The truth is, we had no comforters; for the country was againſt us. If the land had been under my own culture, I ſhould have taken off half as much more; but I did not

not chooſe to offend the perſons whom I wiſhed to inſtruct.

I went down again, in the ſpring of 1791, to ſee the effect, and found the tenants much pleaſed with the operation, and did not find one wound in an hundred but what was in a clear healing ſtate: and the healing of the wounds is the buſineſs; for nothing but prejudice can make a perſon think, that a tree overloaded with wood will produce good fruit: you may as well expect a crop of large turneps without hoeing; and I am in great hopes that pruning will become as general as hoeing; and I am ſure it is as neceſſary.

The medicated tar above mentioned, as uſed in the foregoing experiments, was compoſed of one quarter of an ounce of corroſive ſublimate, reduced to fine powder, by beating with a wooden hammer, and then put into a three-pint earthen pipkin, with about a glaſs full of gin, or other ſpirit, ſtirred well together, and the

ſublimate thus diſſolved. The pipkin was then filled, by degrees, with vegetable or common tar, and conſtantly ſtirred, till the mixture was blended together as intimately as poſſible; and this quantity will, at any time, be ſufficient for two hundred trees.

To prevent danger, let the corroſive ſublimate be mixed with the tar as quickly as poſſible, after it is purchaſed; for, being of a very poiſonous nature to all animals, it ſhould not be ſuffered to lie about a houſe, for fear of miſchief to ſome part of the family.

SIR,

THIS is to certify, that our father planted the orchard, about the year 1773, on an old hop-ground, with apples and cherries, and took great care of it; and the trees grew wonderfully; but by being ſuffered to run with little pruning, and the branches

branches breaking by the wind and other cauſes, the trees became galled and were decaying; which being mentioned to our landlord, Mr. Thomas Skip Bucknall, he came down the firſt Tueſday in November, 1790, and walked over the orchard with us, and an experienced woodman, for two hours, giving his inſtructions how he would have the work done; and we began at day-light the next morning, and kept conſtantly to our work until the Saturday night following.

The progreſs was thus: we ſtood and examined the tree, then cut out every branch any way decayed or galled, or where there appeared any curled leaves. That being done, we thinned the tree to give it a uniform head, and that the air and ſun might freely paſs through: afterwards, we took off all the ſtumps which had been injudiciouſly cut before. We never ſhortened a branch, but took it off cloſe to where it ſhot out from the other part of the tree.

Mr. Bucknall conſtantly attended, and was determined that we ſhould cut cloſe, ſmooth, and even, holding the left hand under the branch, that it ſhould not ſhiver the bark. We alſo took off every branch which croſſed the tree, leaving none but thoſe whoſe extreme branches tended outwards. We were ſometimes in doubt whether a branch ſhould be taken off or not. The rule Mr. Bucknall eſtabliſhed was, Conſider, will that branch be in the way three years hence: if it will, the ſooner it is off the better; and it is ſurpriſing how ſoon we got into ſuch a method, that we went on with as much unconcern, as with any of the common labours of the field. A ſervant was employed to ſmooth, with a knife, all the places where the ſaw had been, and to rub them over with the medicated tar; and that was done directly, that the wind ſhould not dry or ſplit the wood. Formerly, when we uſed to take off a large branch or two, the wounds generally cankered; which made us leave them in the

encumbered

encumbered ſtate they were in, rather than run any hazard; but, to our great ſurpriſe, the wounds, after this operation, all healed; which we can no otherway account for, but from what Mr. Bucknall ſays, that the medication deſtroys the vermin, and by cutting quite cloſe to the remaining branch, the flow of the ſap draws the ſides of the wounds together. Be that as it may, the trees are perfectly healed; and we are ſo well ſatisfied, that we intend to thin ſome of the trees a little more next autumn, and ſtrongly recommend the practice.

With regard to the fruit, laſt year was a failing year in the county; but we had as much as our neighbours, and the fruit was certainly clearer from ſpecks. We were alſo directed to be very careful to rub off all the ſuckers which might come out in the ſpring, and did it accordingly. All the trees have bloomed exceedingly fine, and perfectly ſtrong and healthy. Should any further circumſtance occur, we

will inform the Society of it. We are, with great reſpect,

SIR,

Your obedient humble ſervants,

ROBERT BOULDING.
JAMES BOULDING.

Sittingbourne,
May 27, 1792.

Mr. MORE.

SIR,

THIS is to certify to the Society for the Encouragement of Arts, Manufactures, and Commerce, that, ſome time ſince, I appriſed Mr. Bucknall, that his orchard, in the occupation of Mrs. Boulding, lying in this place, was in a very declining ſtate; and in autumn, 1789, having ſome buſineſs with him, I again repeated to him my thoughts relative thereto; and that, if ſomething was not done to recover the trees, I ſuſpected that great part, if not all of them, would certainly die.

die. In the following ſpring, Mr. Bucknall came to Sittingbourne, and pointed out to the Mr. Bouldings (Mrs. Boulding's ſons) and myſelf, that where there was any blotch on the tree, or the bark, ſevered therefrom, the wound was full of vermin; which, he ſaid, was the cauſe of the trees doing ſo badly; and thereupon undertook to prune one of them, and uſed a medicine he bought in the town; but ſoon breaking his knife, little was done. He ſaid, he could eaſily reinſtate the trees, and bring them to health; and, if Mrs. Boulding would find three or four men, that he would come down again and prune them, and would be anſwerable the trees ſhould not ſuſtain any injury.

Accordingly, when Mr. Bucknall came down again, and pruned the trees, I attended whilſt ſeveral were done, and ſaw them all after they were done; but muſt mention, in juſtice to my own veracity, that I thought they made the trees appear too much like ſcare-crows. But now the

trees

trees have good heads, and are very full of fruit; I think, far beyond the crop in general; and the wounds healed, except three or four cherry-trees, which were ſo far gone, that Mr. Bucknall did not chooſe to touch them; and they are now almoſt dead.

I have but one more obſervation to make, and that I wiſh to impreſs upon the minds of the Society: that, in walking over the orchard this day, there is no one branch ſhortened; and I now ſee, that the merit of the pruning conſiſts in deſtroying the vermin, keeping the branches at a due diſtance, and leaving the extreme ſhoots perfect, that the tree may grow as round and large as poſſible.

I have the honour to be,

SIR,

Your very humble ſervant,

BR. FAUSSETT,
Attorney at Law.

Sittingbourne,
May 27, 1792.

Mr. MORE.

SIR,

SIR,

THIS is to certify, that I have been long acquainted with the orchards planted by the late Mr. Thomas Boulding, on the lands of Thomas Skip Bucknall, Eſq. containing about ſix acres, ſituated in the pariſh of Sittingbourne; that the trees throve well for ſome time—I ſuppoſe, for the firſt ten or twelve years. After that time, many died; and many were wounded with the canker in the bark, from the bottom of the body even to the top arms: and the orchards, though in an infant ſtate, ſeemed going very faſt to decay (though as well managed as any in the neighbourhood the whole time). In November, 1790, Mr. Bucknall came to Sittingbourne, and was ſeveral days aſſiſting and directing his own ſervants, and Mrs. Boulding's people, in pruning the trees. After pruning, a medical preparation was applied to the wounds: the work ſeemed to be well done; but it was the opinion of many, that the trees were thinned too much.

I have

I have ſeveral times ſince viewed the trees; and, by his deſire, went over the orchards this morning. I find the greateſt part of the trees in a very good thriving way: thoſe that were in a very bad ſtate ſeem recovering faſt; the wounds in the bark, and thoſe occaſioned by pruning, are healing very faſt. I am ſo convinced of the propriety of the treatment, that I intend practiſing the ſame myſelf. I beg my reſpects to the Society; and am, SIR,

Your moſt humble ſervant,

JOHN LAKE.

Bapchild,
May 28, 1792.

Mr. MORE.

SIR,

IN anſwer to your requeſt of the 13th ult. concerning the preſent ſtate of the orchard which I now occupy, as tenant, and under the direction of Thomas Skip Bucknall, Eſq.

The

The orchard is now in good condition; and, by experience, I highly approve of pruning the trees: though this laſt ſeaſon was very unfavourable for all kinds of fruits, ſtill the fruit, the produce of this ſeaſon, far exceeds the quality of that of my neighbours. The Flemiſh cherry was every tree blighted, owing to the ſharp froſty mornings, when in bloom; therefore produced no fruit this year. The produce of the Engliſh cherry, May-duke, amber-heart, Turkey-heart, white-heart, and black-heart, very large, fine, and plentiful, far exceeding that of my neighbours. The apples far exceed all this part of the county; the produce plentiful, and very fine in quality; free from ſpecks, and of a fine ſize: that of my neighbours, the produce ſmall, fruit ſmall, and very ſpecky; therefore, of a very bad quality.

I am, SIR,

Your obedient ſervant,

ROBERT BOULDING.

Sittingbourne,
Nov. 17, 1792.

Mr. MORE.

SIR,

SIR,

I BEG the favour of you to make my acknowledgements to the Society for the Encouragement of Arts, Manufactures, and Commerce, with many thanks for their attention to me, in adjudging their Silver Medal, as a reward for the aſſiduity I have ſhewn, to bring the pruning of Orchards to ſuch a determined ſtate as to make the trees healthy, beautiful, and productive.

I flatter myſelf that, from the proofs of the utility of the method, and the countenance it has received, an emulation will be excited in the country for bringing that branch of Agriculture to vie with others, which owe their riſe to the honourable patronage given by the Society to every object which

which promiſes to produce any public utility.

I have the honour to be,

SIR,

Your moſt obliged humble ſervant,

THOMAS SKIP DYOT BUCKNALL.

Hampton-Court,
Dec. 4, 1792.

Mr. MORE.

The

The four following Papers having been ſent, in claim of the Premium offered for Comparative Culture of Wheat; the SILVER MEDAL and TWENTY GUINEAS were adjudged to Mr. ARTHUR TABRUM, he having cultivated the largeſt quantity of land, to aſcertain the advantages of thoſe different methods of culture. But the Society, in conſideration of the merits of the three other Papers, voted to each of the Candidates a SILVER MEDAL, as marks of their approbation of the accuracy of the experiments made by them.

MY LORDS AND GENTLEMEN,

FROM the year 1781 to 1788, I practiſed farming, in the old broad-caſt way, on various ſoils, but chiefly light.

Michaelmas,

Michaelmas, 1789.—I borrowed one of Cooke's old machines, and drilled about ſeven acres with wheat, by way of experiment; the ſucceſs of which induced me to purchaſe one of his new ones, for my own uſe.

Michaelmas, 1790.—I drilled all my wheat; and in the ſpring following, my Lent corn and turneps: and I had no reaſon to be diſſatisfied with drilling.

Michaelmas, 1791.—Having a piece of land, called Cowhouſe Field, of ſixteen acres, a light ſandy loam, the ſoil of equal quality throughout, and in the ſame ſtate of cultivation exactly; it occurred to me to make the experiment, as propoſed by the Society for the Encouragement of Arts, Manufactures, and Commerce. This field, in the ſpring 1791, was drilled with ſummer tares, fed off the latter end of July, and ploughed three times afterwards for wheat. The laſt week in October, 1791, I drilled at nine inches ſix acres and ſixteen

rods, at one ſide of the field, with ſix pecks per acre; and ſowed, at the ſame time, the remainder of the field, broad-caſt, with twelve pecks per acre. It was then very wet weather: the wheels of the drill balled or clogged much; but I did not ſee that the plant came up the worſe for it. Both the drill and broad-caſt were attacked by the wire-worm; but the broad-caſt did not appear to ſuffer ſo much as the drill: through the winter the broad-caſt looked better than the drilled, being a much fuller plant.

February 1, 1792.—I ſcarified the drill wheat deep, viz. four or five inches, which threw the mould upon the plants very much; but was in a day or two harrowed off, by going acroſs with common harrows, and was repeated in about a fortnight. This ſtirring of the ſoil gave the plants freſh vigour; but, in my opinion, deſtroyed a great number of plants, the ſoil being light. I have ſince got a ſet of light harrows, with wood teeth, for that uſe; which does the buſineſs much better. From this time, and

and through the months of March and April, the drill plants, though thin on the ground, appeared much more healthy, and a darker green than the broad-caſt, which was then very yellow and ſickly.

May 5.—Hand-hoed, and harrowed, the broad-caſt, according to my cuſtom: ſame time the drill was hand-hoed; the broad-caſt, at 5s. per acre; the drilled, at 3s. per acre. It is not my practice to hand-hoe my drilled crops; for I think horſe-hoeing is by far the beſt: but I had ſo thin a plant, from the worms, &c. that I was afraid the man could not ſee the rows, ſo as to work the horſe-hoe properly; otherwiſe, I ſhould have horſe-hoed at 6d. per acre, in preference to hand-hoeing, if both at a price.

The latter end of May, and beginning of June, the drilled branched out ſurpriſingly, and maintained its ſuperiority, in ſtrength of ſtraw, and longer ears, till harveſt; when both drill and broad-caſt, viz. ſix acres ſixteen rods each were reaped ſeparately, carried ſeparately, and ſtowed ſepa-

rately in the barn; alſo thraſhed ſeparately, by the ſame ſervants: when it appeared, that the produce of the ſix acres broad-caſt, leaving out the ſixteen rods, to avoid fractions, of both drilled and broad-caſt, was one hundred and fifteen buſhels, or nineteen buſhels per acre; the produce of the ſix acres drilled, one hundred and twenty buſhels three pecks, or twenty buſhels one gallon per acre; difference, in favour of the drilled, one buſhel one gallon per acre. The quantity of ſtraw broad-caſt is two hundred and thirteen truſſes, of thirty-ſix pounds per truſs; from the drilled, two hundred and fifty-five truſſes; which, at three-pence per truſs, for home conſumption, leaves ten ſhillings and ſixpence, or one ſhilling and nine-pence per acre, in favour of the drilled. The grain of both crops I ſold to Mr. William Smith, of Bow, Middleſex; the broad-caſt at five ſhillings and three-halfpence per buſhel—the drilled, at five ſhillings and four-pence halfpenny: difference, in quality of grain, by the drill, at three-pence per buſhel, is five ſhillings per acre, without fractions. This difference

rence in quality of the grain of the drilled crop, I attribute to the crop having fewer weeds in it than the broad-caſt; the expence of drilling and broad-caſt equal.

The average advantage, in favour of drilling, per acre, is as follows:

	£.	s.	d.
Seed ſaved, per acre, at 6s. per buſhel — — —	0	9	0
Superior crop, ditto —	0	5	4½
More ſtraw, ditto —	0	1	9
Better quality of grain, ditto	0	5	0
More labour beſtowed on the broad-caſt crop, per acre	0	1	4
	£.1	2	5½

The above ſtatement reſpects the crops of the drilled and broad-caſt. There remains a circumſtance to be taken into the caſe, viz. the difference of the preſent condition of the land of the drill and the broad-caſt: the former, by ſcarifying, harrowing, and hoeing, is clean, compared with the broad-

caſt, and fit for a ſpring crop: the latter is foul, and fit for a fallow only. This difference of cleanneſs I eſtimate at twenty ſhillings per acre, in favour of the drill; at leaſt, it would coſt me as much to make the broad-caſt land as clean as the drilled. I muſt own, at one time in the ſpring, before I ſcarified the drilled crop, I had doubts of its ſucceſs; and I do believe, that if it had not been ſcarified, and harrowed early, it would have failed; but it improved ſo much after it was ſcarified, that I am perſuaded the ſucceſs was owing to that performance; and it is my opinion of drilling in general, that if it is not practiſed according to Mr. Cooke's directions, of ſcarifying early, it would not anſwer on my farm.

The latter end of July, 1792, I drilled, with Cooke's drill, a field of fourteen acres, with 14 ounces of turnep-ſeed per acre; and I never had a better crop: they were fed off with ſheep and bullocks on the land. Afterwards, with the aſſiſtance of Mr. Cooke's ſcarifyers and ſcufflers, I procured a ſufficient

ſufficient tilth for my barley ſeaſon, without ploughing at all, ſave and except one acre in the middle of the field, which was ploughed as uſual, by way of experiment. At harveſt, the ploughed acre was not ſo good a crop, and much fouler, with ſummer weeds, poppy, blue-bottle, &c. By cultivating with the ſcarifyers and ſcufflers, as above, I ſaved four ſhillings and ſixpence per acre. Some of my neighbours plough three times for barley, and do not get ſo good a tilth, nor a better crop than I got without it.

The latter end of March, I drilled the above fourteen acres, with ſix pecks of barley per acre. As ſoon as I could ſee the rows, I ſcarified and harrowed acroſs, with my light harrows with wood teeth; when my neighbours declared I had ſpoiled my crop. A gentleman of much experience in farming, who was at my houſe, and went into the barley, the day after the operation of ſcarifying, declared I had ſpoiled my crop, and that I could not expect to get any

barley: nevertheleſs, I had confidence in Mr. Cooke; and in a fortnight after I ſcarified, and harrowed acroſs again. The firſt week in May, I horſe-hoed, and drilled in my clover ſeed, in the middle of the intervals, and have got a fair plant; and by the middle of May, none of my neighbours could ſay my crop was ſpoiled. I eſtimate the produce at forty buſhels per acre, from a piece of poor gravelly ſand, which never brought me more than twenty-four buſhels before. A root, and its produce, I have ſent.

I have now growing twenty-two acres of drilled wheat, and eleven acres of rye, which look well: one of the pieces of wheat was drilled after turneps, which were deſtroyed by the fly: this field was once ploughed about Chriſtmas, 1791, and has not been ploughed ſince. The tilth for turneps was obtained by the ſcarifiers and ſcufflers; alſo for the wheat, after the turneps failed, by the ſcarifiers and ſcufflers, and is cleaner by far than any tilth wheat I have in

in the old method, at half the expence of ploughing. I would recommend the land to be deep and well ploughed at Chriſtmas, or ſooner, for this practice.

I am,

My Lords and Gentlemen,

Your moſt humble ſervant,

ARTHUR TABRUM.

Aveley, Eſſex,
Feb. 1, 1793.

To the Society for the Encouragement of Arts, &c.

SIR,

THIS is to certify, that I meaſured, for Mr. Arthur Tabrum, a quantity of land, being part of the Cowhouſe Field; which ſaid field contained ſixteen acres; and, on the north ſide, I meaſured off ſix acres, ſixteen rods, which was ſowed with a drill

a drill at nine inches; and the part next adjoining, I meaſured exactly the ſame quantity, which was ſowed broad-caſt, as was the remainder of the field. The field lying near the road, where I often paſſed, I frequently viewed the crops of corn, and believe them to be fairly ſtated.

WILLIAM MAYDEN,
Schoolmaſter.

Aveley, Eſſex,
Feb. 1, 1793.

Mr. MORE.

SIR,

I LIVE very near Mr. Arthur Tabrum; our lands are adjoining. I frequently walk with him; and I ſaw his ſeveral operations on the comparative crops of wheat, growing in his field, called the Cowhouſe Field; and I firmly believe his ſtatement is perfectly right; and was preſent

ſent when the threſhers declared, that every care was taken, and that they were ſeparately threſhed, and likewiſe the difference of ſtraw in the two crops; and I am, for my own part, more partial to the drill ſyſtem than I ever was.

I am, SIR,

Your humble ſervant,

ROBERT SHAVE.

Aveley, Eſſex,
Feb. 4, 1793.

Mr. MORE.

SIR,

FOR ſome years I have drilled different ſorts of corn, but did not make any accurate experiments to determine the comparative advantages of the drill and broad-caſt, till I obſerved a wiſh, expreſſed by the Society, of ſuch an experiment being made.

In

In conformity to their propoſals, I have the honour to ſend you three different ſets of experiments, the firſt of which ſeems to be, in every point, agreeable to the advertiſement. It is neceſſary for me to explain why I have carried my enquiries further than what related to the eight acres: you will obſerve, that I have not only endeavoured to aſcertain the comparative excellence, between the two modes of ſowing, but have alſo attempted to diſcover which of the three drills will produce the beſt crop; whether the drills ſhould be at nine or eleven inches; and whether a larger or ſmaller quantity of ſeed has the beſt proſpect of ſucceſs. Theſe were objects which appeared to me worthy of inquiry: how far I have ſucceeded, I leave to the deciſion of the Society. All that I lay claim to, is credit for impartiality and correctneſs: not confiding in my ſervants, but truſting alone to my own perſonal obſervation, at every period of this experiment, from ſowing the

the ſeed to meaſuring the produce, I am able to make myſelf reſponſible for the account I ſend you.

My firſt experiment was made upon a very heavy clover ley, which, when ploughed, was very rough: here the drill was inferior to the broad-caſt. In my ſecond experiment, the latter appeared to be, by far, the moſt promiſing crop till the month of April, when the former made a moſt extraordinary progreſs. Not being uſed to Perkins's drill, I ſowed too ſmall a quantity of ſeed: till the month of May there was ſo thin a plant, that I ſhould have ploughed it up, if I had not wiſhed to ſee the effect of a ſmall quantity of ſeed. In my third experiment, the drill was again victorious; and, indeed, I have not the ſmalleſt doubt of its ſuperior merit, whenever it is uſed properly, upon ground fit to receive it.

I have in contemplation, a mode of culture of wheat, which I think will be well adapted

adapted to the drill; and alſo be likely to overcome the ravages of the worm, which is very apt to attack our wheat ſown on a clover ley. Inſtead of ſowing my clover land with our wheat, I mean to plant it with beans; which I ſhall keep clean by horſe-hoes, and I ſhall drill wheat after the beans.

I muſt now inform you, that all the drilled wheat, of which I have the honour to ſend you an account, was twice horſe-hoed, and once hoed by hand: the broad-caſt wheat was alſo hoed by hand. The fifteen parcels were houſed in fifteen different places, and were ſeparately threſhed with the greateſt care: I have ſamples of each parcel ready for the inſpection of the Society, if deſired. I think, I need not ſay, that theſe experiments have been attended with no ſmall degree of trouble; but I ſhall not think it miſplaced, if the reſult of them ſhould throw any light upon a purſuit

a purſuit, which is my buſineſs and delight.

I have the honour to be,

SIR,

Your moſt obedient humble ſervant,

MONTAGUE BURGOYNE.

Marſh Hall, Harlow,
Eſſex, Feb 4, 1793.

Mr. MORE.

You will perhaps be ſurpriſed, that I ſhould accommodate my firſt experiment more exactly to the rules of the Society, than I have done in my ſecond and third. The fact is, I was not aware that the experiment ſhould be tried on eight acres; and beſides, I had not a ſufficient quantity of ground in the ſame field, of equal goodneſs. I hope, however, that it will

will be underſtood, that I have ſtrictly conformed to the rules preſcribed: and I beg leave to remark, that the account of the failure of the drill, in one inſtance, may, perhaps, afford as much information to the agriculturiſt as the other two experiments which have ſucceeded.

An Account of Eight Acres of Wheat, ſown on Mark Hall Farm, in the County of Eſſex, in a Field called Lodge-Croft, on a Clover Ley, of two Years. The Soil a heavy Loam, on an Underſtratum of Clay. It was ſown the 1ſt of November, 1791, *and reaped in Auguſt*, 1792.

	Seed ſown		Produce			Straw
	Bls.	Pks.	Qrs.	Bls.	Pks.	Truſſes
No.						
1 An acre ſown with Ducket's drill at 9 inches	2	2	2	6	½	58
2 An acre ſown with Ducket's drill at 11 inches	1	2	2	4	½	56
3 An acre ſown with Ducket's drill at 9 inches	3	¼	2	4		56
4 An acre ſown with Cooke's drill at 9 inches	1	3	2	6	¾	59
Total of four acres drilled	8	3¼	10	4	1¾	229
5 Four acres broad-caſt	13	2	13	5	3½	285
Difference in favour of the Broad-caſt			3	1	1¾	65

An

An Account of Four Acres of Wheat, ſown October 15, 1791, on the ſame Farm, in a Field called Lodge Croft; the Soil a heavy Loam, with an Underſtratum of Clay. The Part ſown had been broken up in the May preceding, after being twenty months in Clover, and was become a good Tilth. The Wheat was reaped in Auguſt, 1792.

No.	Seed ſown Bls.	Pks.	Produce Qrs.	Bls.	Pks.	Straw Truſſes
6 One fifth part ſown with Ducket's drill at 11 inches	1	2½	3	6	1	90
7 One fifth part ſown with Cooke's drill at 9 inches	1	1½	3	6	3	99
8 One fifth part ſown with Ducket's drill at 9 inches	2	½	3	6	½	95
9 One fifth part ſown with Perkins's drill at 9 inches		3½	3	5	1	86
10 One fifth part ſown broadcaſt	2	¼	3	5	½	102

An Account of Five Acres of Wheat ſown on the ſame Farm, in a Field called the Broom Field, on a Clover Ley of One Year; the Soil a ſandy Loam, on an Underſtratum of Gravel. It was ſown November 5, 1791, and reaped in Auguſt, 1792.

No.	Seed ſown Bls.	Pks.	Produce Qrs.	Bls.	Pks.	Straw Truſſes
11 One acre ſown with Ducket's drill at 11 inches	1	3½	3	5	3	90
12 One acre ſown with Ducket's drill at 9 inches	2	2½	4			95
13 One acre ſown with Cooke's drill at 9 inches	1	2½	3	5	2¾	82
14 One acre ſown with Ducket's drill at 9 inches	3		3		½	52
15 One acre ſown broadcaſt	2	3	3	4	½	70

N. B. From the firſt ſet of experiments it appears, that the produce of the broad-caſt exceeds the drill by three quarters one buſhel one peck and three quarters; yet as there is a ſaving of four buſhels two pecks and three quarters by the drill, the profit of the former is reduced to two quarters four buſhels and three pecks.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, having offered an Honorary Medal for the moſt approved ſet of experiments, made on eight acres of land, to determine the comparative advantages of cultivating wheat by broad-caſt or drilling; it is with great deference the following account is ſubmitted by,

SIR,

Your moſt obedient humble ſervant,

EDWARD TRELAWNY.

Upminſter, Eſſex,
Feb. 2, 1793.

Mr. MORE.

Experiments

Experiments on the Drill and Broad-caſt Huſbandry of Wheat, made on Eight Acres Three Roods of Land.

THE field, in which the major part of my efforts were made, towards aſcertaining the comparative merits of the two modes of culture, contains ſeven acres two roods; the ſoil an excellent light dry loam, in the following ſtate of cultivation, viz.

1789, Turneps.
1790, Barley.
1791, Clover.

The turneps, an extraordinary good plant, were twice hoed, and fed off with ſheep. The barley, full ſix quarters per acre; but the bulk of ſtraw being great, and heavy rains falling about three weeks before harveſt, occaſioned nearly the whole to be lodged: a material injury to the clover was the conſequence; added to which, the ex-

treme drought in the following month of May and part of June, operated ſo powerfully, that the whole crop conſiſted of only five light waggon loads; and that, unaccountably foul with catlock, needles, &c. notwithſtanding the turneps and barley were both exceeding clean. Upon this I determined to try the effect of a ſhort fallow; accordingly it was immediately ploughed, which was repeated in Auguſt, with proper harrowing, &c. during the interval: this, as far as could be judged at that ſeaſon, appearing to have anſwered the purpoſe intended, it lay till ſeed-time. Between the 27th of October and the 3d of November, after a third ploughing, it was ſown as under, viz. three acres one rood and twenty perches broad-caſt, and the like quantity drilled with the Reverend Mr. Cooke's machine, in equidiſtant rows of nine inches; the remaining three roods were contained in the head lands and gores, or ſhort lands, which I left out of the queſtion. The drilled was ſcarified the 30th of March, 26th of April, and the

19th

19th of May; the vegetation ſeemed to be conſiderably aſſiſted thereby, eſpecially the firſt time. I ſhall defer giving the quantity of ſeed and crop to a particular detail hereafter of the whole.

The following is a ſtatement of the remaining two acres, the ſoil of which is a ſound mellow loam, of a ſtronger nature than the preceding piece, but much exhauſted by the deſtructive ſyſtem of barley, oats, or wheat, in ſucceſſion. However, I fixed on this ſpot, after early hog peas, in 1791, in the middle of a field of thirteen acres, for the ſole purpoſe of experiment between one acre on a ſingle ploughing, and the other after three ploughings. This comparative trial ſuggeſted itſelf to me under the general idea, that, without a proper tilth for the coulters to work, the drill culture will not ſucceed. I wiſhed to prove this as nearly towards a clear demonſtration as poſſible; I therefore ploughed one part in Auguſt, again in September, and about the 24th of October: after a

third ſtirring, one half drilled, the remainder broad-caſt, the other acre on one ploughing, equally divided in like manner, drilled and broad-caſted the ſame day. The latter of both experiments were hand-hoed twice, the beginning of April and early in May; the drilled, ſcarified the 30th of March, horſe-hoed the 26th of April, and again ſcarified the 19th of May. My obſervations during the growth of both fields were exactly as have been remarked by the generality of drillers, viz. that the broad-caſt ripened earlieſt, the ears of the drilled conſiderably the longeſt and fulleſt ſet; and, from the ſtrength of ſtraw, ſtood the heavy rains and winds beſt.

Each diviſion was carefully ſeparated at harveſt, under the immediate eye of myſelf, or a friend, to whoſe ſedulous attention I am much indebted. Memorandums were made of the places and manner of houſing; and I am equally clear as to the threſhing, being preciſely conformable. It remains

remains to give the detail, which, I flatter myſelf will, on examination be found correct.

Wheat, ſix Acres three roods, after a ſhort fallow with three ploughings.

	Qr.	B.	P.	G.
One acre drilled with two buſhels, produce	3	5	3	1
One acre drilled with one half-buſhel, produce	3	5	0	0
One acre drilled with one quarter ditto	3	4	3	0
	10	7	2	1
Three acres ſowed broadcaſt with ſix buſhels one peck	9	0	3	0
Difference in favour of the drill on three acres	1	6	3	1

	B.	P.	G.	Q.	B.	
Twenty perches, drilled with one gallon one quart, or one buſhel one peck per acre, produced	3	1	1	or 3	3	per acre
Twenty ditto broadcaſted with the ſame quantity, produced	2	1	1	2	3	ditto
Twenty ditto, drilled with two gallons two quarts, or two buſhels two pecks per acre, produced	3	1	0	3	2	ditto
Twenty ditto broadcaſt with the ſame quantity, produced	2	3	1	2	7	ditto
Twenty ditto, drilled with three gallons or three buſhels per acre, produced	3	0	1	3	1	ditto
Twenty ditto, broadcaſt with the ſame quantity ditto, produced	3	1	1	3	3	ditto
Six acres three roods,	total of ſhort fallow.					

The

The experiments of twenty perches were made with a view towards coming at a ſtandard quantity of ſeed: upon a reference, it appears, that one buſhel one peck per acre drilled, and two buſhels two pecks per acre broad-caſt, were the moſt proportionably productive. Taking the account in the aggregate, the drill has conſiderably the advantage, as thus:

	£.	s.	d.
Three acres one rood twenty perches, drilled with five buſhels two pecks three quarts, produced twelve quarters one buſhel one peck one gallon, at 44s. - -	26	15	7
Expences.			
Five buſhels two pecks three quarts of ſeed, at 6s. 6d. - - 1 16 5			
Drilling, per acre, at 1s. 0 3 5			
Three ſcarifyings, at 9d. - - - 0 7 0			
Threſhing, at 4s. - 2 8 9			
	4	15	7
Net produce £.	22	0	0

Three

	£.	s.	d.
Three acres one rood and twenty perches, ſowed broad-caſt, produced ten quarters one buſhel one peck one gallon, at 44s. — —	22	7	7
Expences.			
Seven buſhels three quarts of ſeed, at 6s. 6d. 2l. 6s. 1d. } Threſhing 2l. os. 9d. }	4	6	10
Net produce	£.18	0	9

leaving 3l. 19s. 3d. in favour of the drill; which is 1l. 3s. 6d. per acre, within a trifling fraction

One Acre, on one Ploughing.

Produce of two roods broad-caſt, one quarter one buſhel, three peck one gallon, at 44s.	2	14	4
Expences.			
One buſhel of ſeed, 6s. 6d. Two hand-hoeings, 4s. 3d. Threſhing - - 5s. od.	0	15	9
Net produce	£.1	18	7

Produce

Produce of two roods drilled, one quarter one peck one gallon, at 44s.	£.	s.	d.
	2	6	0

Expences.

One buſhel of ſeed,	6s. 6d.		
Drilling,	os. 6d.		
Two ſcarifyings and one horſe-hoeing	1s. 2d.		
*Hand-raking, after horſe-hoeing,	os. 9d.		
Threſhing	4s. 4d.		
	0	13	3
Net produce	£.1	12	9

Leaving 5s. 10d. or 11s. 8d. per acre, in favour of the broad-caſt.

Experiment

* It has been uſual to harrow the lands acroſs, after horſe-hoeing; but having experienced its miſchievous tendency, of frequently burying the plants ſtill more, beſides tearing others up, the raking with common hand-rakes occurred to me. This perfectly anſwered the end, and, I am of opinion, will be adequate to clear the rows, without injury in the ſmalleſt degree.

Experiment of one Acre, after three Ploughings.

		£.	s.	d.
Two roods drilled, produced one quarter four buſhels two pecks one gallon, at 44s.		3	10	1
Expences.				
One buſhel of ſeed	6s. 6d.			
Drilling - -	os. 6d.			
Two ſcarifyings and one horſe-hoeing -	1s. 2d.			
Hand-raking, after horſe-hoeing - -	os. 9d.			
Threſhing - -	6s. 5d.			
		0	15	4
Net produce		£.2	14	9

Two roods ſown broad-caſt produced one quarter three buſhels one peck, at 44s.		3	1	10
Expences.				
One buſhel of ſeed,	6s. 6d.			
Two hand-hoeings	4s. 3d.	0	16	5
Threſhing	5s. 8d.			
Net produce		£.2	5	5

leaving

leaving 9s. 4d. or 18s. 8d. in favour of the drill.

The experiment on the eight acres three roods being conſolidated, it will appear, that four acres one rood twenty pecks drilled, left a net return of 26l. 7s. 6d. and four acres one rood twenty perches, broad-caſted, 22l. 4s. 9d. or near 18s. per acre in favour of the drill ſyſtem.

Throughout every ſtage of theſe experiments, I have diveſted myſelf of that partiality which the drill culture, from the benefit I have derived during three ſucceſſive harveſts, lays claim to: and it is with ſome degree of vanity I reflect, that my ſucceſs has been the means of extending the practice.

If I have in theſe accounts been prolix in my calculations, I reſpectfully hope the Society will attribute it to my wiſh to give an exact ſtatement of the expenditure, as well as product: without both, I conceive the whole muſt be deficient.

I am

I am perſuaded the judicious farmer will find ample room for cenſure of the mode I adopted in the preparation of my lands for theſe experiments: I will therefore beſpeak his candour, by aſſuring him, they are the feeble attempt of a junior brother of the plough, now only in the fourth year of his attendance on the Goddeſs Ceres.

*** It may not be improper to note, that the crop from the ſix acres three roods, ſhort fallow, was but little affected with the weeds complained of in the clover, being a very fair ſample.

EDWARD TRELAWNEY.

Upminſter, Eſſex,
Feb. 2, 1792.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, having offered the Gold Medal as a reward for

for the Comparative Culture of Wheat, I beg you will be ſo obliging as to lay the following experiments before them.

The land on which the experiment was made, is eſteemed a very good brown light ſoil, few ſtones, dry, and inclining gently to the ſouth, chalk bottom about thirty inches deep. The year before, it was ſown with barley and clover-ſeed only; the graſs was made into hay, about the middle of June, 1791. The eight acres cloſe together were immediately manured, and ploughed in: it lay in that ſtate until ſeed-time; then dregged, and harrowed down. the four acres were drilled firſt with Cooke's plough, two buſhels one peck to each acre; finiſhed in the laſt week in September, 1781. The four acres cloſe adjoining, broad-caſt, were finiſhed the firſt week in October, 1781: I allowed three buſhels to an acre of each—nine gallon meaſure. The eight acres were then rolled down.

The

The crops came up well, and flouriſhed during the winter and ſpring: the ground was rather free from weeds; but I had both crops hoed by women, in the month of April. The ſummer proved very wet and ſtormy, which hurt the crops not a little. About the middle of Auguſt, the eight acres were reaped, and the corn houſed in good condition; great care taken to ſeparate them in the barn. The drilled was firſt threſhed out, which produced fifty-three buſhels one peck and one gallon clean corn. The broad-caſt produced ſixty-four buſhels three pecks and one gallon clean corn; both excluſive of tithes, and Wincheſter meaſure: it was ſold in the pariſh of Ropley, for 14l. per load for ſeed. The drilled had not near ſo many hulls as the broad-caſt. The weight of one buſhel of drilled was ſixty-one pounds; of the broad-caſt, ſixty-three pounds and one half.

I ſhall be very happy if this experiment meets the approbation of the Society. I have taken the liberty of ſending them a ſample

ſample of each. I beg my moſt reſpectful compliments to thoſe Gentlemen; and am, SIR, with eſteem,

Your moſt obedient ſervant,

JAMES RODNEY.

Ropley, near Arlesford, Hants,
October 5, 1792.

Mr. MORE.

I DO certify, from almoſt daily obſervation, from the time of the wheat being ſown to its being houſed in the barn, that the account given by Mr. Rodney is a juſt and fair account, and appears, in my opinion, deciſive in the comparative culture of Wheat, under the given circumſtances of ſoil and ſituation.

WILLIAM HOWLEY,
Vicar of Ropley.

Ropley,
Nov. 3, 1792.

The THANKS of the Society were given to JOSEPH SIBLEY, Eſq. of Market-ſtreet, Hertfordſhire, for the following Communication, which may throw ſome light on the long-agitated queſtion concerning the Tranſplanting and Dividing the Roots of Corn.

SIR,

WHEN I had the pleaſure of ſeeing you laſt, I left with you a ſmall box, containing two thouſand grains of wheat, the produce of one grain in one year. I have now ſent you the root and ſtalks upon which they grew, which I beg the favour of you to preſent to the Society for Encouragement of Arts, Manufactures, and Commerce, if you think they will be acceptable. I ſhall juſt add a ſhort account of the plant.

In

In September, 1790, I ſowed ſix grains of wheat in a garden-pot. In February, 1791, they were turned out of the pot, when their roots were very numerous, and much interwoven: they were tranſplanted into the garden, in a ſingle row, at one foot diſtance, the roots and tops being firſt ſhortened, where they ſoon filled the ſpace between each other; when one of the internal plants was taken up, and divided into ten parts, each having a ſmall fibre, and tranſplanted in one row, a foot from each other: this was done in order to ſee the difference between dividing the root, and that which was not divided, as much as has been ſaid concerning the tranſplanting and dividing the roots of corn. The plants were kept clean from weeds. The produce as follows:

Auguſt, 1791.---The plants were taken up; and that whoſe root had not been divided, produced one hundred ears, containing two thouſand grains. Another, whoſe root had been divided, produced al-

together ninety ſtalks and ears; but the number of the grains could not be aſcertained, as the birds had carried away the greateſt part of them; whereas the former was preſerved by a net.

I ſhall not make any remark on the wonderful fertility of this plant, as I have no ſyſtem to favour or recommend, but have merely related the fact; and will leave to the Society (of which I have the honour of being a Member) to make their own remarks, hoping they will do me the favour to accept this ſmall preſent, which I have taken the liberty of tranſmitting to you.

I remain, SIR,

Your moſt obedient ſervant,

JOSEPH SIBLEY.

Market-ſtreet,
Jan. 26, 1793.

Mr. MORE.

The

The SILVER MEDAL and TEN GUINEAS, being the Premium offered for Stall-feeding Horſes with Green Vegetables, was this year adjudged to Mr. PETER SMITH, of Hornchurch, Eſſex; from whom the following Papers and Certificates were received.

MY LORDS AND GENTLEMEN,

HAVING obſerved that the Society for the Encouragement of Arts, Manufactures, and Commerce, have offered a premium for feeding horſes with green vegetable food, I take the liberty of ſubmitting to the Society's conſideration, the following experiments, which have been made with the greateſt exactneſs.

From the 21ſt of April, 1792, to the 22d of September following (twenty-two weeks), I kept four horſes in the ſtable on

rye, winter and ſummer tares; rye, two roods and two perches; winter tares, one acre one rood and ten perches; ſpring tares, two acres one rood and ſeventeen perches, one rood of which was left unconſumed: conſequently, the whole quantity of land on which theſe green vegetables were produced, amounts to three acres three roods and twenty-nine perches. The expence as follows:

	£.	s.	d.
One ploughing after wheat,			
at 6s. per acre - - -	1	3	7½
Seed - - - -	2	16	0
Harrowing - - -	0	1	3
Rent and Taxes - -	3	19	0
	£.7	19	10½

Which, omitting the fractions, is one ſhilling and ninepence three farthings per week for each horſe. This, I believe, would have ſupported my horſes, at common farmers work, with little or no corn; but, as they did nearly double work, I gave an extra quantity

quantity of corn, viz. fifteen quarters five buſhels, which I value at fourteen pounds ſixteen ſhillings and ten-pence, or three ſhillings and three-pence farthing per week, each horſe.

If my horſes had been at graſs in the field, I ſhould have given them the ſame quantity of corn, on account of their hard work. One of the advantages of ſtall-feeding conſequently appears from the difference of the value of the food conſumed, compared with the value of common graſs, which is near one hundred per cent. in favour of ſtall-feeding; the expence of green food being, as above ſtated, one ſhilling and nine-pence three farthings per week, each horſe: but if my horſes had been at common graſs, I ſhould value their keep at three ſhillings and ſix-pence, or four ſhillings, per week, each horſe.

From the time I began to keep my horſes with green vegetables, as above, to the laſt

week in Auguſt, they were in a thriving ſtate: afterwards, they did not do ſo well, on account of the wetneſs of the ſeaſon, which mildewed the tares. During the above twenty-two weeks, my horſes had no reſt whatever on working days. The firſt month they carted dung from Romford, three journeys a day, of ſeven miles per journey; the loads of dung, from two and a half to three tons per load: the remainder of the time, they went three times a week to London with ſtraw, and brought dung and chalk rubbiſh back; each journey, thirty-three miles: the other days, at plough, ſcarifying, ſcuffling, fallows, hay-cart, harveſting, and other work on the farm: the weight of the dung obtained from my own horſes, during the ſtall-feeding, was eighteen tons one hundred one quarter and ſixteen pounds, calculated from the produce of ten weeks, weighed at ten ſeparate times. I have charged nothing for the carter's time in cutting the green food, as it came within his day's work; and they were

were carted home by the ſame horſes that conſumed them, as much at one time as would laſt two days.

I am,

My Lords and Gentlemen,

Your moſt obedient humble ſervant,

PETER SMITH.

Hornchurch,
Feb. 11, 1793.

I BENJAMIN BISHOP, of No. 5, Hare-court, Temple, do certify, that being at Mr. Peter Smith's houſe, the greateſt part of laſt ſummer, for the benefit of my health, I had an opportunity of ſeeing his method of ſtall-feeding horſes.

BENJAMIN BISHOP.

Feb. 12, 1793.

SIR,

SIR,

UPON the application of Mr. Smith, I went to meaſure a piece of land, ſown with rye, for feed; the contents of which were two roods and two perches; as alſo a piece of land ſown with tares, the contents of which were three acres two roods and twenty-ſeven perches.

Witneſs my hand,

JOHN THOMPSON.

Hornchurch,
Feb. 11, 1793.

Mr. MORE.

THIS is to certify, that I, James Garner, ſervant to Mr. Peter Smith, of Hornchurch, Eſſex, being his carter and ſole manager of his experiment of ſtall-feeding horſes, and having heard my ſaid maſter's account read, I do believe the ſame to be true.

JAMES GARNER.

Hornchurch,
Feb. 11, 1793.

TEN GUINEAS, part of the Premium offered for diſcovering the cauſe, and pointing out an effectual cure for the diſeaſe called the Curl in Potatoes, was this year adjudged to Mr. WILLIAM HOLLINS, of Berriew, in Montgomeryſhire; it appearing he had not entirely conformed to the terms of the Advertiſement, his method being rather a preventive than a cure of the malady. See other Papers on the ſame ſubject, by Mr. HOLLINS, Vol. VIII. page 18, and Vol. IX. page 52.

SIR,

I MUST deſire you to lay before the Society theſe additional remarks on the Curl in Potatoes, which are the reſult of experiments made ſince my laſt communication.

As

As ſome perſons, after the moſt careful management, may have ſome of their potatoes infected (the reaſon of which is ſhewn in page 61, Vol. IX.) and others are obliged to buy their ſeed in the market; I thought it would prove highly beneficial to the country, if there could be a method found to diſtinguiſh, in that caſe, the ſound from the unſound; but this was hard to determine, for the outward appearance gives no indication of the infection. I hope, however, that the following experiment, which I made in my own field, before the perſon who aſſiſted me to plant my potatoes, whoſe certificate I ſend herewith, and alſo one made in another perſon's garden, will, if properly attended to, effectually anſwer that purpoſe.

In cutting potatoes for ſets, care ſhould be taken not to cut them entirely through; but when the knife has penetrated to about the half, the other half ſhould be ſlived or broken off. By this operation you may underſtand whether the potatoe

tatoe has proper vegetative power or not; if the knife enters eaſily, and the potatoe breaks off ſoft, then it is fit for ſeed; but if, on the contrary, the knife enters with ſome difficulty, and the potatoe breaks off harſh and rough, though it may not appear to want ſap, yet it is void of proper vegetative power, and unfit for ſeed; for if planted, it will either remain whole in the ground till dug, or produce a complete curled crop. However, if made uſe of as food, it will boil ſome minutes ſooner, and eat dryer and mealier than a ſound potatoe.

Regard ſhould always be had to the nature of the ſoil where potatoes are to be planted: wet heavy ſoil will ſtarve and rot them, in the ſame manner as it will ſcald and ſtarve any kind of grain, eſpecially in a wet ſeaſon; and alſo ſharp ebb ſoil, where there is not ſufficient mould to protect them from the ſcorching heat of the ſun, will dry up the vegetative power, in the ſame manner as it will cauſe any kind of grain

to

to wither and die away, particularly in a hot ſeaſon.

Care ſhould alſo be taken not to plant them in unprepared ground and freſh manure; for I have found by repeated experiments, that freſh manure is a great detriment to the potatoe, when ſet in it; as in ſome kind of ſoil, and in ſome ſeaſons, it will cauſe even a ſound plant to curl in ſome degree; but ſhould the plant be in the leaſt unſound, the whole crop will be entirely curled, becauſe the heat of the manure dries up the vegetative power. Preparing the ground in time, likewiſe, will be a great means towards killing the weeds, which not only injure the potatoe much, but impoveriſh the ground alſo.

The beſt method of managing the ground, in my opinion, is the following: plough it in the beginning of January, and, in a month's time, or ſooner if the weather permits, harrow it, and manure it well on the ſurface, as you would for turneps; then

then plough it in, and let it lie till the middle of April, by which time the froſt will have tempered the ground, and the manure will be rotted; then plough it acroſs and harrow it; and after that ridge it up, and plant your ſets, care always being taken that there is ſoil in the bottom of the furrow.—Thus you will not only inſure a good crop of ſound potatoes, but alſo have your ground much better prepared for wheat, than by ſummer fallowing. This I have frequently proved.

About three years ago, I had, from ſomewhat leſs than a chain acre of land, two hundred buſhels of potatoes (our buſhel is forty quarts), which, at two ſhillings a buſhel, the price of potatoes then, was worth twenty pounds. Here it muſt be obſerved, that a much larger crop might be raiſed, by earthing and manuring to the utmoſt, which may and ought to be done with potatoes intended for food only; but, as I always ſell the greateſt part of mine for

for ſeed, the whole was cultivated according to the directions given to raiſe ſeed potatoes, in my former papers. The potatoes were taken up in October, and wheat ſown on the ſame ground, with one ploughing only, and without any freſh manure, which produced thirty buſhels of clean corn. This, at eight ſhillings a buſhel, the average price of wheat then, was worth twelve pounds, which, added to the twenty pounds, the value of the potatoes, makes thirty-two pounds, the produce of leſs than an acre in ſeventeen months, from April, 1789, to September, 1790.

I beg leave to mention one other experiment made laſt year, which, though not applicable to the curl, yet may ſerve as a hint for others to do the ſame; for, from the ſucceſs I had, I have no doubt but it will be very profitable, if generally practiſed. After the rows of potatoes were covered, I ſet, with a ſtick, about ten quarts of beans along the middle of the

the rows: both grew up together very well, and came to perfection, without injuring each other in the leaſt. The beans grew ſtrong and upright, and the potatoes, as is uſual, bent a little to each ſide: the produce of the beans was two buſhels; they podded better than common, which I attribute to the diſtance they were ſet from each other.

The Society will remember that I ſaid in my laſt papers, that I ſhould not be ſurpriſed if there would be more curl potatoes this year, than there has been ſince the year 1786. The great and general complaints in this neighbourhood, and in other parts, prove that it was too true. I hope this will ſatisfy the Society, that what I advanced concerning the curl, &c. was not founded on extravagant conjectures and bold aſſertions, but on a thorough knowledge of the nature and cauſe of it.

I have been informed, by a native of America, that what we call the long red American potatoe, grows in that rich and newly-cleared ſoil to a very large ſize; but that the potatoes proceeding from the roots were never uſed as ſeed; for there ſprung from the ſtalk, very near the ſurface of the ground, ſmall potatoes as they called them; but, he ſaid, they were about the ſize of thoſe raiſed in England, and thoſe were always planted. I hope the Society will forgive my mentioning this, as it confirms what I have already ſaid, "That ſmall potatoes are beſt for ſeed.

I muſt beg leave to enumerate the principal cauſes from which the curl proceeds, and then conclude.

Firſt, From potatoes being forced by cultivation to overgrow their power for vegetation.

Secondly,

Secondly, From their vegetative power being dried up in ebb ſoil by the ſcorching heat of the ſun; and,

Thirdly, From their being expoſed too long, after they are cut into ſets, before they are planted.

Now, I am confident, that I have pointed out the cauſe and cure of the Curl; and I will be bold to ſay, that the directions I have given, if carefully followed, will be crowned with ſucceſs; and I perſuade myſelf, that no one, who has paid a proper attention to the ſubject, will diſagree with me. This may appear bold, ſound too much of egotiſm; yet I flatter myſelf, that I ſhall be forgiven, when it is conſidered, that I advanced facts, verified by repeated experiments, and not mere conjectures; and that I am endeavouring to eſtabliſh a mode of cultivating that moſt uſeful root, which, if practiſed,

will prove of infinite benefit to the public.

With great deference and reſpect,

I remain, SIR,

Your moſt humble ſervant,

WILLIAM HOLLINS.

Berriew,
Nov. 19, 1792.

Mr. MORE.

THIS is to certify; that I, John Bullock, aſſiſted Mr. Hollins to plant his laſt crop of potatoes, and was eye-witneſs to the cutting of the ſets, when he ſhewed me the difference between the ſound and unſound plant. The potatoes were taken promiſcuouſly from the heap; and thoſe that proved, in the cutting, to be unſound, were thrown on one ſide, and planted

by themſelves, in the end of a row, and a ſtake driven into the ground for a particular mark. I aſſiſted Mr. Hollins alſo to dig up his potatoes, and ſaw that the unſound plants, quite to the mark, were completely curled, and not one kind amongſt them: but the whole crop, except the above-mentioned part, were kind, and produced a good crop; as witneſs my hand, this 9th day of November, 1792,

JOHN BULLOCK.

SIR,

HAVING had ſome converſation laſt year with Mr. Hollins, about the curl potatoe, he told me, among other things, that he expected there would be more curled crops this year than has been ſince the year 1786; and I find, he ſaid the ſame in his papers to the Society laſt year. I own, that I thought his aſſertion rather bold, which induced me to pay par-

ticular attention to that ſubject; and I found, to my ſurpriſe, that he was perfectly right. The complaints of the Curl is univerſal in theſe parts; it has extended its pernicious effects to the more hilly part of this country, where it was hardly known before, even by name; and the potatoes, in conſequence of it, in a great meaſure, (though there are a few inſtances of their being rotted in the ground) are become very dear already.

This appears to me a clear proof of his thorough knowledge of the nature of that diſeaſe. What confirms my opinion is, that his own crop this year, and the crops of thoſe that bought their ſeed of him, ſeveral of whom I know, were quite free from that diſeaſe. I do not know any body in this neighbourhood that cultivated their potatoes according to his directions: ſome are ſo opinionated, that they will not allow him to know more than themſelves; others think they cannot raiſe more than half the crop by following his mode, not conſidering

dering that he directs but a ſmall portion of their potatoe-ground, only as much as they intend for ſeed, to be cultivated in that particular manner. However, I have no doubt, but a few repeated mis-crops will conquer the moſt obſtinate prejudice; and that Mr. Hollins's mode, from the ſucceſs that attends it, will, in a few years, become univerſal.

Should any thing here advanced, any way further the intention of the Society, it would be eſteemed a happy circumſtance by him who is the Society's and

Your moſt humble ſervant,

ROBERT WILLIAMS,

Miniſter of Berriew.

Berriew,
Nov. 17, 1792.

The

The GOLD MEDAL, being the Premium offered for feeding Cattle and Sheep with Potatoes, was this year adjudged to WILLIAM BARBOR, Eſq. of Fremington, near Barnſtaple, Devonſhire; from whom the following Papers were received.

MY LORDS AND GENTLEMEN,

SEEING, in the news-paper, that you give premiums for the encouragement of agriculture, I beg leave to become a candidate for the medal that will be given for tilling the greateſt quantity of potatoes for feeding cattle.

In 1791, I planted twenty-four acres for that purpoſe, in two fields, as named in the certificate, which is ſigned by, and well known to, the clergyman and churchwardens

dens of this pariſh. I will ſtate to you an account how they were tilled, and the expence of it, as exact as poſſible. I had them planted after three different methods, and three different manures, viz. dung, cob or mud walls, and rotten ſtraw: the produce of one acre manured with dung, was two hundred and fifty-five ten-peck bags; cob or mud walls, one hundred and twenty-eight ten-peck bags; rotten ſtraw, one hundred and two ten-peck bags. The whole was ploughed twice: the firſt method, I had the trenches cleaned out by men with ſhovels, which I found expenſive: the ſecond, I uſed a beat-rake, with a board placed at the bottom; a man, boy, and horſe, can clean out three acres per day, and anſwer as well as the former; by which method I planted the whole, except two acres: the third I ploughed in, which I diſapprove of; therefore planted only one acre in that manner. I have ſtated a full and particular expence of one acre planted according to the three different methods, manured with dung, as follows:

Firſt

First Method.	£.	s.	d.
Ploughing twice	0	9	0
Dragging - -	0	1	3
Cleaning out the ridges with ſhovels - -	0	4	0
100 horſe-load of dung, at 3d.	1	5	0
Spreading dung	0	1	6
Planting potatoes	0	1	0
Healing - -	0	4	0
Ten bags and a half of potatoes, at 1s. 8d.	0	17	6
Cutting - -	0	1	0
Second healing	0	3	0
	£.	3	7 3

Second Method.	£.	s.	d.
Ploughing twice	0	9	0
Dragging - -	0	1	3
Cleaning out the ridges with beat-rakes -	0	0	10
Dung - -	1	5	0
Spreading dung	0	1	6
Planting potatoes	0	1	0
Healing - -	0	4	0
Potatoes - -	0	17	6
Cutting - -	0	1	0
Second healing	0	3	0
	£.	3	4 1

Third Method.	£.	s.	d.
Ploughing twice	0	9	0
Dragging - -	0	1	3
Ploughing under furrow -	0	5	0
Dung - -	1	5	0
Spreading dung	0	1	6
Planting potatoes	0	1	0
Healing - -	0	4	0
Potatoes - -	0	17	6
Cutting - -	0	1	0
Second healing	0	2	6
	£.	3	7 9

On

On twenty acres of theſe potatoes, I fed fifty-ſix bullocks: the other four acres I gave, cut in ſlices, as fodder for young cattle; which I found to anſwer beyond my expectation, and would recommend to all breeders. The cattle I bought in very lean, being determined to feed them entirely on potatoes. The food being too ſtrong for them, in the firſt place, made them ſcour for about three weeks, of courſe did not get much; but after it ſtopped, they throve very well: thoſe that were in a better ſtate, the food had not that effect on; and I would recommend all thoſe that feed cattle on potatoes, to buy them in as near half fat as poſſible, which will pay double to thoſe bought in lean. I tried ſheep; but the weather had been ſo wet for two or three ſeaſons before, that I had ſcarce a ſound ſheep in my flock; and of courſe it did not anſwer.

I planted three different ſorts of potatoes, the white and red Iriſh, and the white yam. I found no difference in the goodneſs as to the

the ſeed; but the white yam produced between fifty and ſixty bags more on an acre; and the white yam being ſo much larger, there is not that danger of the bullocks being choaked. Bullocks fed on potatoes, I found to be ſubject to two maladies, viz. ſwelling, and being choaked. There is no danger in either, if paid attention to in time: their ſwelling is eaſily got rid of, by driving them about the yard; and the potatoe in their throat may be got down by a ſmooth ſtick. The expence of taking up an acre of potatoes is about one pound ſix ſhillings: that acre ploughed under furrow was red Iriſh, and produced only eighty-three ten-peck bags. I attempted to plough them up again, but was obliged to dig them over again. The fields being in turneps, the year before, there was no expence in weeding.

I ſhould have charged only half the dung to the potatoes, as my ground was in excellent order for wheat, and had a better crop than has ever been ſeen in this neighbourhood.

bourhood. I will trouble you no further; but remain,

My Lords and Gentlemen,

Your obedient humble ſervant,

WILLIAM BARBOR.

Fremington,
Oct. 27, 1792.

THIS is to certify, that the above is true, as it was carried into execution by me, under Mr. Barbor's directions.

ROBERT SQUIRE.

THESE are to certify, that Mr. Barbor, of Fremington, in the county of Devon, did plant, in the year 1791, the Barn-park and North-eaſt Chill-park, meaſuring about twenty-four acres, both in the ſaid pariſh, with potatoes, and fed fifty-ſix bullocks.

SAMUEL COOKE, Vicar of Fremington.
JOHN BLACKMORE, }
HUGH SLOLEY, } Churchwardens.

THIS

THIS is to certify, that a field, known by the name of Barn-park, the property of Mr. Barbor, of Fremington, in the county of Devon, and in which field potates are now growing, for the purpoſe of feeding cattle and ſheep, meaſures nineteen acres three roods and thirty-two perches; and alſo that another field, known by the name of North-eaſt Chill-park, the property alſo of the ſaid Mr. Barbor, on the ſame eſtate, and on which potatoes are now alſo growing, for the purpoſe of feeding cattle and ſheep, alſo meaſures four acres and ſixteen perches.

JOHN TAMLYN, of Barnſtaple,
Surveyor.

Fremington, near Barnſtaple,
Oct. 19. 1792.

SIR,

LOOKING over the advertiſement, after I had ſent away my laſt letter, I thought I had not been ſo explicit as I ought, as to the

the ſucceſs that attended my bullocks feeding on potatoes: ſo will trouble you once more with an account of what the bullocks coſt me, and the profit I made on them.

I bought in fifty-ſix bullocks for three hundred and eighty pounds eighteen ſhillings, and ſold them for five hundred and eighty pounds eighteen ſhillings; which was a clear profit of two hundred pounds, as the dung will more than pay for ſtraw and labour. Each bullock, on an average, eat three pecks of potatoes a day; which, at the rate they then ſold for, was two ſhillings and ſix-pence per week. I know of no other particulars; ſo remain,

SIR,

Your humble ſervant,

WILLIAM BARBOR.

Fremington,
Oct. 29, 1792.

Mr. MORE.

The Committee of Agriculture having thought proper to tranſmit the following Queſtions to Mr. Barbor—

" How long the cattle were fed on the potatoes?

" Whether the cattle were ſold to the butcher immediately from the potatoes?

" Whether any, or what quantity of hay or ſtraw, or any other food, he ſuppoſes was given the cattle duriug the time they were fed with potatoes?

The ſubſequent letter was received from him in anſwer thereto.

SIR,

I RECEIVED the favour of yours, and will anſwer your queſtions as clear as poſſible. The firſt, as to the time they were feeding on potatoes? I anſwer—I put the bullocks in feeding the 10th of December: moſt of them were fit for the butcher by the 1ſt of March, when I had a ſurvey; but the number being too great

great for the conſumption of the country, I did not ſell many that day: I ſold them afterwards, as purchaſers offered: they were all gone by the 4th of May, except four, which did not go off till the latter end of the month. The ſecond queſtion, Whether they were ſold to the butcher or not? I anſwer—they were, all, except three, which were ſold to a jobber, and the greateſt part killed immediately from my ſtalls. The third, as to the quantity of hay or ſtraw? I anſwer—For the firſt week I gave them hay, which, I thought, would prove expenſive, and not pay; ſo I tried ſtraw, which I found to anſwer full as well, as the bullocks eat the potatoes better. The quantity of ſtraw I kept no account of, but am certain the dung paid for all.

I remain, SIR,

Your humble ſervant,

WILLIAM BARBOR.

Fremington,
Dec. 1, 1792.

Mr. MORE.

The Premium having been this year adjudged to WILLIAM BARBOR, Eſq. in conſideration of his having cultivated the greateſt quantity of Land with Potatoes, for the purpoſe of feeding Cattle and Sheep (ſee the foregoing Papers); the following Letter from Mr. JAMES BUCKNELL, to whom the Premium for feeding Cattle and Sheep with Potatoes was adjudged, in the year 1790 (ſee Vol. IX, p. 45), having been alſo received; the SILVER MEDAL was voted to him for the Communication.

SIR,

IN the laſt year, 1791, I cultivated ſixteen acres and three roods of land with potatoes, for the ſole purpoſe of feeding cattle and ſheep; and which I applied in the following manner. Being lately come much into the breeding of cattle, I gave a great

great part of the potatoes to young cattle, ſuch as yearlings, two-years old, &c.: but, however, I fed, for the butcher, eleven heifers and twelve oxen laſt year, chiefly on potatoes, only giving them ſometimes a little hay and oat-ſtraw. I gave about a buſhel of potatoes a day (which is four pecks, Wincheſter meaſure) to each heifer or ox, and altered the quantity, as I found it neceſſary to give them more hay or ſtraw: to the younger cattle, which were about ſeventy, I gave a leſs quantity, according to their different ages, with a larger proportion of hay and ſtraw. The manner of giving the potatoes to the cattle differs nothing from what I have deſcribed, and tranſmitted to the Society, in a former Paper, and which is inſerted in the ninth volume of their Tranſactions: but during laſt winter, eſpecially in bad weather, I gave a conſiderable quantity to my ewes, which conſiſted of about ſix ſcore in number, giving ſometimes a bag of potatoes, containing twelve pecks Wincheſter meaſure, to a ſcore of ewes, in a day; which

are carried out, and thrown abroad, on the ſurface of the paſture-land. The ewes, after having been uſed to this manner of feeding two or three days, will immediately gather round the perſon who carries them out, and eat the potatoes with great eagerneſs. As to the ſucceſs attending this branch of agriculture, I can only ſay in general, and that, I think, from ſufficient experience, that I have been able to keep a larger number of cattle and ſheep, and that in a more thriving ſtate, than by any other means that I have tried.

The manner of cultivating this uſeful and valuable root, for the purpoſes aforeſaid, which I now uſe, as ſuperior to all other methods that I have practiſed or known, is by ploughing them in, in the following manner: having made the land to a good fallow, and dung for manure brought and ſpread upon ſuch part of the ſame as is immediately intended for potatoes,—when the firſt furrow is ploughed, ſome of the labourers drop the potatoes, firſt cut in pieces,

in

in the bottom thereof; and others, with rakes, in which are ſhort iron teeth, rake the dung, that is near the edge of the furrow, into the ſame, upon the potatoes. I then have two furrows more ploughed, without dropping any potatoes therein; and then, in the next, drop potatoes, and rake in the dung upon them, as before; and thus continue in the ſame manner; ſo that the potatoes are placed in every third furrow, and all lie under the dung; and the dung is got into ſuch furrows only as the potatoes are dropped in. A man and boy, and two horſes, will thus plough an acre in one day; and ſix labourers, which may moſt of them be women or boys, will drop the potatoes, and manage the dung for the ſame quantity of land, in a day, without their ſtopping for the plough, or the plough for them.

I thus let the potatoes remain about a month; at which time they generally begin to appear above ground, growing up in green ranks, about two feet aſunder: I then,

with another plough, which muſt be made different from that uſed at firſt, becauſe it muſt throw up the earth on both ſides of it; with this plough and two horſes, I order a man to go between the two furrows, in which no potatoes were dropped, which is between the ranks; and this throws up the earth over the potatoes, on both ſides, and ſerves for a ſecond covering, and at the ſame time deſtroys the weeds. This being done, they remain to grow, and are little hurt by weeds, till fit to be taken up for uſe. A man and boy, and two horſes, with this plough, will perform, for this ſecond covering, three acres in a day.

The whole expence of tilling an acre of potatoes, in this manner, from the firſt breaking up the ground, including dung for manure, potatoes for ſeed, and labour, amounts to about five pounds. Should any thing I have here written, merit the further attention of ſo reſpectable a Society, and promote the improvement of agriculture, I ſhall at all times be ready to communicate

municate any future obſervations relative thereto; and am, with great reſpect,

SIR,

Your moſt obedient humble ſervant,

JAMES BUCKNELL.

Knowſtone, near Tiverton, Devon,
Nov. 9, 1792.

Mr. MORE.

THIS is to certify, that I meaſured for Mr. James Bucknell, of Knowſtone, a quantity of land, containing ſixteen acres and three roods ſtatute meaſure; in all which land potatoes were cultivated in the year 1791; and, being an inhabitant of the ſame pariſh, have the greateſt reaſon to believe they were ſolely applied to the purpoſe of feeding cattle and ſheep; as witneſs my hand,

GEORGE TARR, Surveyor.

WE, the underſigned, having read Mr. Bucknell's account of his cultivation of potatoes, for the purpoſe of feeding cattle and ſheep, being perſons dwelling near him, do hereby certify, that we believe the ſame to be ſtrictly true; as witneſs our hands,

T. FROUDE, Vicar of Knowſtone.
S. FISHER, Churchwarden.

The

The SILVER MEDAL and TEN GUINEAS, being the Premium offered for the beſt account of the utility and advantage of the drill, or broad-caſt method, in the culture of turneps, was this year adjudged to Mr. Peter Smith, of Hornchurch, in conſequence of the following account, received from him on that ſubject.

SIR,

I DO myſelf the pleaſure of ſending you an account of an experiment I made, to determine the comparative advantage of the drill and broad-caſt method of cultivating turneps, made on a field of ſix acres, a mixed ſoil or gravelly loam; which I beg you will lay before the Society for the Encouragement of Arts, Manufactures, and Commerce.

In

In Auguſt, 1791, the field produced me a crop of rye, which, immediately after harveſt, was ploughed: in October, it was twice ploughed and three times harrowed.

On the 2d and 3d of November, it was ſown with early peas, to pod for London market, which were all gathered in June, 1792; and, in July, the land was made a perfect clean fallow, by three times ploughing, four times harrowing, and once rolling. Auguſt the 6th, 1792, the field was equally divided and ſown, half with Mr. Cooke's drill, and half broad-caſt; the drill with one point of ſeed per acre, at one foot apart; the broad-caſt, one quart per acre.

By ſcarifying thoſe drilled turneps, when they had their four leaves, they became the ſooneſt ready to ſet out by the hand-hoe, which was done at three ſhillings per acre; the ſcarifying, eight-pence per acre; the hand-hoeing broad-caſt, ſix ſhillings per acre. The expence of labour ſaved by the drill

drill is, therefore, two ſhillings and four-pence per acre; the drill turneps the largeſt plants, and the land in the beſt tilth.

On the 4th of January, 1793, I had four roods of the drilled turneps, and four of the broad-caſt, weighed, under my direction and ſuperintendance, and in the preſence of the Vicar of the pariſh, whoſe certificate is annexed. In the ſame manner, on February the 18th, I meaſured two other roods of the drilled, and two of the broad-caſt, both parcels of which were weighed with the greateſt accuracy; and the product of each reſpective meaſurement and weight, was as follows:

Drill.	*Cwt.*	*Q.*	*lb.*
January 4, No. 1.	5	2	21
2.	5	2	0
February 18,	5	0	14
Total, ſix roods drilled	16	1	7

Broad-caſt.

Broad-caſt.	*Cwt.*	*Q.*	*lb.*
January 4, No. 1, -	4	3	27
2, -	4	3	2
February 18, - -	4	3	8
Total, ſix roods broad-caſt	14	2	9

	Ton.	*Cwt.*	*Q.*	*lb.*
Average per acre drilled	21	15	0	0
Average per acre broad-caſt	19	8		63
Advantage in favour of the drill, per acre	2	6	0	22

Having large crops of turneps this year, I ſold two acres, at five pounds ten ſhillings per acre.

	£.	*s.*	*d.*
The drilled turneps have the preference at the above value, per acre,	0	13	0¼
Expence ſaved in hoeing	0	2	4
In favour of the drill, per acre	0	15	4¼
In favour of three acres drilled	£.2	6	2¼

I have

I have drilled all my wheat but ſeven acres, and that for experiments, the whole being fifty acres; I have likewiſe drilled my tares, peas, and lent corn, all experimentally, which, I hope, will give me an opportunity to make ſome experiments, that I may have the pleaſure to lay before the Society.

I am, SIR,

Your humble Servant,

PETER SMITH.

Hornchurch, Eſſex, April 15, 1793.

Mr. MORE.

THIS is to certify, that in Auguſt 1792, I meaſured a field of Mr. Peter Smith's, at Hornchurch, Eſſex, containing ſix acres, and divided the ſame into two equal pieces, of three acres each.

And,

And, on the 4th of January, 1793, I, in the preſence of the Vicar of the ſaid pariſh, meaſured off two roods of drilled turneps, and two roods of broad-caſt; and, in another part of the ſaid field, meaſured off too roods more of each, in order for the ſame to be weighed, which was done in my preſence. Alſo, on the 18th of February, 1793, I meaſured off, in preſence of the ſaid perſon, two roods more of drilled, and two roods of broad-caſt turneps, for the above purpoſe of weighing, which I alſo ſaw weighed.

Witneſs my hand, this 15th of April, 1793.

JOHN THOMPSON.

Hornchurch, Eſſex.

THIS is to certify, that on the 4th of January, 1793, I attended at Mr. Peter Smith's farm, in this pariſh, and ſaw two roods of drilled turneps, and two roods of the ſame broad-caſt, meaſured off; and, on the ſame day, in another part of the

the field, ſaw two other roods of drilled and broad-caſt turneps meaſured. All theſe parcels were ſeparately weighed in my preſence; and the amount was as beneath.

	Cwt.	*Q.*	*lb.*
Firſt meaſurement, drilled, two roods,	5	2	21
Second meaſure -	5	2	0
	11	0	21

	Cwt.	*Q.*	*lb.*
Firſt meaſurement, broad-caſt, two roods,	4	3	27
Second meaſurement	4	3	2
	9	3	1

On the 18th of February, 1793, I again ſaw two roods of drilled, and two roods of broad-caſt turneps, meaſured and weighed in the ſame field as before, the reſult of which was as follows:

Drilled

Drilled turneps.			Broad-caſt turneps.		
Cwt.	*Q.*	*lb.*	*Cwt.*	*Q.*	*lb.*
5	2	14	4	3	8

W. H. REYNALL,
Vicar of Hornchurch.

April 19, 1793.

I JAMES GARNER, ſervant to Mr. P. Smith, did ſow, ſcarify, and weigh the above turneps; as witneſs my hand,

JAMES GARNER.

Hornchurch, Eſſex,
Feb. 15, 1793.

The

The GOLD MEDAL, being the Premium offered for the Culture of Rhubarb, was this year adjudged to Mr. THOMAS JONES, from whom the following Papers were received.

SIR,

BY laying before the Society the enclosed certificate, you will very much oblige me; and, if you are of opinion that the communications which accompany it, are of sufficient importance, you will flatter me extremely by submitting them to their consideration.

I have for several years entertained an idea, that Rhubarb may be cultivated in this Island, to very great advantage, provided we could ascertain the soil which was most congenial to it, and would afford it

age. This idea was confirmed, upon being put in poſſeſſion of a root, which was the produce of a garden in Enfield; the ſoil a ſtiff loam, lightened with rotten ſaw-duſt: but, whether from age or the moiſture of the ſituation, I cannot determine, it was unfortunately nearly all decayed: I ſay unfortunately, having never been capable of procuring another, in order to carry on my experiments further as to its cure, which certainly is of equal importance with its cultivation; but, notwithſtanding I met, as I have juſt obſerved, with ſufficient information to confirm me in my opinion, the ſounder parts were of a very ſuperior quality; indeed, it equalled any Ruſſia Rhubarb I ever ſaw, and exceeded, by many degrees, the imports of the preſent day. Its effects I have had repeated opportunities of proving, through the favours of ſome medical friends in the country, of the greateſt reſpectability; and I was happy to find it anſwered every expectation.

I have

I have diſpoſed of the whole, excepting two or three ounces of the ſmalleſt pieces; and I have the pleaſure to inform you it continues free from the worm, which is its greateſt enemy; and has, in a great degree, retained its original beauty, though it is nearly two years ſince it was cured.

Theſe circumſtances, and the hope of being honoured with the Gold Medal of the Society, determined me to become a planter; and I obtained a piece of ground in the neighbourhood as ſoon as I was able. The ſoil, in ſome places, is loam entirely; in others, loam mixed with gravel; but, in general, rich and light. It had been laid down with graſs for many years; and to prepare it for my purpoſe, I had it ploughed, and ſowed it with turneps; wherever I intended to plant a root, that ſpot was dug about three ſpit deep, and the ſurrounding earth heaped upon it to a conſiderable height, forming a diſtinct hill for every plant. I was induced to adopt

this plan, for ſeveral reaſons: it is eſſentially neceſſary to the cultivating Rhubarb properly, that, in the firſt inſtance, it ſhould have a great depth to penetrate, and that it may afterwards enlarge: the earth about it ſhould be light, and continue to be kept ſo.

It is amazing to obſerve with what ſurpriſing rapidity it will grow, if it meets with theſe advantages. I ſpeak from experience. A root produced from a ſeed ſown in June, 1791, was tranſplanted into my garden, and upon one of theſe hills, in April, 1792. In the courſe of the ſummer it diſplayed palmated leaves, which, I obſerve, is ſeldom the caſe in their firſt ſeaſon, which meaſured four feet from one point to the other in breadth, and three in length. By its remaining ſo ſteady, and reſiſting, contrary to all my expectations, conſidering the ſize of its leaves, every inclemency of the weather, I was led to conclude its progreſs below had kept pace with that above; and I was not diſappointed,

pointed, upon examining in the autumn. When it was planted, the tap-root meaſured no more than ſeven inches; in ſix months, its growth extended, to what I cannot exactly ſay; I traced it three feet, and would have carried my reſearches further, but was diſſuaded by my gardener, from an apprehenſion it might injure the plant.

It may be aſked, Where is the neceſſity of elevating your plant ſo much above the ſurface of the ground? Why not dig a deep hole, as is the preſent practice, and if the ſurrounding earth muſt be ſo very light, let that occaſionally be dug likewiſe? My anſwer is, that, in digging round the roots, the beſt ſhoots may be endangered from the ſpade, ſhould they happen to lie acroſs; for, when planted upon a ſurface, and particularly in very rich ground, they do not all ſtrike directly down. But the moſt material objection to this method ſeems to me to be this—the inconvenience ariſing from too large a quantity of moiſture. This root

is naturally very ſucculent, and, of conſequence, liable to decay, particularly from two cauſes, froſt and moiſture: there is juſt as much neceſſity to guard againſt the one, by not expoſing it too much, as againſt the other, by giving it too low a ſituation.

If the different ſpots, deſigned for each plant, are dug into holes, and the ſurrounding earth occaſionally lightened to the ſame depth, it will be capable of retaining a much larger proportion of moiſture than is neceſſary, to the certain detriment of the plantation, without a poſſibility of its eſcaping. Such is the natural growth of this plant, that of itſelf, if not carefully provided againſt, it will aſſiſt in its own deſtruction, from the cauſe which I am treating of. The foliage is ſo very extenſive, that it collects the rain from a conſiderable diſtance around; and ſuch is the poſition of almoſt every leaf, it is conveyed directly to the crown, which, of all others, is that part of the plant the moſt ſuſceptible

of

of decay. How then is this ſuperabundant moiſture to be got rid of? Will it not be taken up by the ſun? Certainly not; for the foliage which continues all the time the ſun has any influence worth mentioning, entirely prevents its penetration, even to the ſurface of the ground. The original diſpoſition of it, therefore, muſt be, I conceive, the only preventive on which any dependence can be had againſt this inconvenience.

Hitherto, all that I have ſaid has relation to a plant of one or two years old. I ſhall moſtly confine myſelf in what I have further to add, to its production and tranſplanting. I am inclined to believe, that many of the loſſes which I at firſt ſuſtained were, in a great degree, owing to the common evil, ariſing from ground newly broken up, ſuch as the wire-worm, called ſo by the gardeners from its ſhape and hardneſs. I cannot help obſerving here, that this is the moſt deſtructive enemy we have: if one is in the hill, it is ſure to prove

ſo; the inſect inſinuates itſelf into the crown of the plant, which it entirely devours; and the root, if not a ſharer in the ſame fate, falls gradually to decay, beginning generally at the lower extremity.

In April, 1792, I procured ſome freſh dung, of which I made a thin layer: over this I ſifted ſome fine mould, to the thickneſs of a foot, and, over the whole, placed a large melon-frame with a pair of lights. It was cloſed for a few days, that the mould might be tolerably warmed; and the ſeed was then ſowed moderately thick. Attention muſt be paid to the temperature of the bed; for if, on the one hand, it is too cold, the greateſt part of the ſeed will not vegetate at all; and if, on the other, it is too hot, the plants, by being forced, will become weakly, and perhaps good for nothing. I began to tranſplant almoſt from their firſt appearance, and now and then ſaved one; but the loſs was ſo exceſſive, as to prove this ſtage not to be the proper one. However, for the ſake of experience,

perience, I continued planting all through the ſummer, though to very little purpoſe. In the fourth week in September, I made my laſt experiment, and ſaved one hundred and twenty-ſeven plants, out of one hundred and thirty.

I attributed the ſucceſs which attended me here, not altogether to the ſeaſon of the year, but, in ſome degree, to the ſize of the plants, and the conſequent increaſe of their fibres, through whoſe means they derive their nouriſhment. I am led to form this concluſion from another experiment, which I made in the month of April laſt, upon ſeventeen plants of about ten months old: from the ſhallowneſs of their ſeed-bed, their roots were very fibrous, and irregular: four of theſe I tranſplanted exactly as they were taken up; the remaining thirteen I endeavoured to train to two or three ſhoots, by depriving them of the greateſt number of their fibres and irregularities. Though the ſame care was taken of them

them all, and planted by the ſame perſon, three out of the four grew, in the courſe of the ſummer, to be fine flouriſhing plants; but the thirteen were every one of them loſt; not, I am aſſured, from inſects, but, as I have no doubt, from their being deprived, as I have juſt now obſerved, of the means through which they receive their nutriment.

From all that has been ſaid, we may draw the following concluſions: That the ſeaſon for ſowing is the ſpring, about March or April, or, in autumn, about Auguſt and September; that thoſe plants which are raiſed in the ſpring, ſhould be tranſplanted in autumn, and *vice verſâ*; That they cannot have too much room; That room and time are eſſentially neceſſary to their being large, of a good appearance, and, as I imagine, the increaſe of their purgative qualities; That, to effect theſe purpoſes, the ſoil muſt be light, loamy, and rich, but not too much ſo, leſt the roots ſhould be too fibrous;

fibrous; That their ſituation can ſcarcely be too dry, as more evils are to be expected from a ſuperabundancy of moiſture, than any actual want of it: and laſtly, we may conclude, That, in particular, the injuries which they are ſubject to, are principally during their infancy, and to be imputed to inſects, and inattention to the planting ſeaſon; afterwards, from too great an expoſure to froſt: but that none can be dreaded from heat; and that, in general, they are hardy, and eaſy of cultivation, when arrived beyond a certain term.

Next ſummer, I purpoſe continuing my experiments and obſervations; and it will afford me great ſatisfaction, if in any, the ſmalleſt degree, I may tend to elucidate a ſubject ſo likely to become of conſiderable national importance: but ſhould I be ſo fortunate as to ſucceed in this humble attempt at obtaining the honourable approbation of the Society, which ſeems actuated only by motives the moſt glorious and praiſe-

worthy,

worthy, it will be a diſtinction which I muſt conſider as unmerited on my part, but never to be eraſed from my memory.

I am, SIR,

Your moſt obedient humble ſervant,

THOMAS JONES.

No. 13, *Fiſh-ſtreet Hill, London.*

Mr. MORE.

THIS is to certify, that Joel Rowſell, of the pariſh of Endfield, in the county of Middleſex, gardener, has planted for Mr. Thomas Jones, of Fiſh-ſtreet Hill, London, four hundred and twenty plants of the Rheum Palmatum, or true Rhubarb, at ſix feet diſtance from each other, in a piece of ground rented of me, by the ſaid Mr.

Mr. Jones, ſituated at Four-Tree Hill, in the pariſh aforeſaid; and that there is every proſpect of their ſucceeding.

WILLIAM SHAW,

Four-Tree Hill, Endfield,
Feb. 16, 1793.

Signed by
the Rev. Mr. SHAW,
in preſence of
S. T. BORMAN.

The

The following Papers, with ſome Samples, ſent in claim of the Premium for curing Rhubarb, having been received, it appeared, that, although the Candidate had ſent in Samples, to the amount of Five Pounds, agreeably to the terms of the Advertiſement, yet it being required that the Samples ſhould be equal to what is ſold in the ſhops under the name of Turkey or Ruſſia Rhubarb; and they being made up of various kinds, ſome of which are not in a ſaleable ſtate; he was not adjudged entitled to the Premium offered: but, as ſome of the Samples were ſuperior in quality, and better cured, than any hitherto produced, the SILVER MEDAL was voted to the Candidate, Mr. THOMAS HALLEY, of Pontefract, Yorkſhire.

SIR,

WITH the annexed certificate, I tranſmit five pounds of true Rhubarb, in various ſamples, for the conſideration of the

the Society for the Encouragement of Arts, Manufactures, and Commerce, in compliance to their rules. I alſo now proceed to the method taken in curing them.

It is, I believe, from twenty to thirty years ago, that my father firſt procured the ſeed of Turkey Rhubarb, from a medical gentleman of this town: ſince which time he had, at intervals, raiſed, cultivated, and cured, the roots, in pretty large quantities. During the laſt war with France, &c. he diſpoſed of it exceeding freely; but, ſince that period, the wholeſale druggiſts have procured it from abroad, at a lower rate than we could afford to ſupply them.

He tried a variety of ways, for the purpoſe of obtaining a proper knowledge of the method of cure, ſuch as waſhing the roots, bruſhing, barking, and peeling them; drying them in the ſun, on a kiln, in a ſtove, and in a warm kitchen: but having lately had the irreparable misfortune to loſe him,

early

early in life, it is not in my power to lay perfectly before the Society the reſult of thoſe experiments.

In a diſſertation on Rhubarb, by Dr. Tirruogel, of Stockholm, the following method is propoſed:—"No roots ſhould be taken up till they have been planted ten years: they ſhould be taken out of the ground either in winter, before the froſt ſets in, or in the beginning of ſpring, and immediately cut into pieces, and carefully barked; let them be ſpread upon a table for three or four days, and be frequently turned, that the juices may thicken or condenſe within the roots. After this proceſs, make a hole in each piece, and put a thread through it; by which let them hang ſeparately, either within doors, or in ſome ſheltered ſhady ſhed. Some perſons dry them in a different way: they encloſe the roots in clay, and make a hole in the clay, about the thickneſs of a gooſe-quill, and in this manner hang up each piece to dry, ſeparately,

rately, that the moiſture may not evaporate, nor the ſtrength of the root be weakened. But the methods which the Tartars follow, is a bad one: they dig the roots out of the deſerts where they grow, bark them, and immediately ſtring them, and hang them round the necks of their camels, that they may dry as they travel; but this greatly leſſens the medicinal virtue of the root."

The Society muſt be well acquainted with the method of waſhing, barking, &c. recommended by Sir William Fordyce, in his late treatiſe; in which he alſo informs of the manner of ſcooping it, uſed by the Mongals, as obſerved by Mr. Bell. Dr. White, in his "Analyſis of the New London Pharmacopœia," mentions an inferior ſort of Rhubarb, which is imported from the Eaſt Indies, in long, flinty, firm, pieces, with a hole in the middle of each; but that "The beſt ſort of Rhubarb is brought from Turkey and Ruſſia, in light round pieces, with a hole in the middle of each: it is, externally, yellow; and, inter-

nally, variegated with reddiſh and yellow ſtreaks.

The roots I now ſend, were, I believe, planted about the year 1781, in a light ſandyiſh ſoil; but, from attention requiſite to more intereſting affairs, were, I underſtand, much neglected. They were taken up laſt ſpring; and, being thoroughly diveſted of the adhering earth, were placed for ſome weeks on the floor of a cool warehouſe: the fibres were then taken off, cut up, and dried on the flue of a green-houſe; but, from miſmanagement in my abſence, were entirely ſpoiled. The prime roots (of which the ſamples No. 2 and 5 are parts) were ſevered in ſmall pieces, peeled clean, and thoroughly cleared of every particle of unſoundneſs. Part was ſeparately laid in ſieves, and the remainder perforated, ſtrung, and ſuſpended in feſtoons from the cieling of a warm kitchen. How they have ſucceeded, the Society will be able to judge, from the fair ſample laid before them.*

ſhem.* The manner of dreſſing conſiſts in paring off the external coat with a ſharp knife, as thin and clean as poſſible, and then finiſhing it off by a piece of fiſh-ſkin, with its own powder; which powder may be procured from the chips and ſmall pieces, either by grinding or pounding it in a large mortar.

Of the ſamples ſent,

No. 1 are ſuch roots as have failed in the drying.

No. 2, What have ſucceeded; but in an undreſſed ſtate (as per certificate).

No. 3, The chips or ſhavings which are neceſſarily taken from the above.

No. 4, The powder made from thoſe ſhavings.

No. 5, The root in its cured and finiſhed ſtate for ſale, of which a ſpecimen is reſerved in the Society's collection, for the inſpection of the public.

* Theſe ſamples appear to be ſuperior to any Rhubarb hitherto cured in England, and produced to the Society.

Part of the roots in queſtion having been planted, when I was engaged in ſcholaſtic purſuits, I am not enabled to be ſo particular as I could wiſh on that head.

The enſuing ſpring it is my intention to plant a quantity, in a ſoil which has a very long time been famous for producing the beſt liquorice; and which, having an affinity in its growth to Rhubarb, I flatter myſelf will ſucceed in a proportionate degree. The Society may rely on a knowledge of all particulars at a proper time, and hope they will be ſuch as to merit their deſirable approbation.

I am, SIR,

Your much obliged ſervant,

THOMAS HALLEY.

Pontefract, Yorkſhire,
Oct. 18, 1792.

Mr. MORE.

THIS

THIS is to certify, that Mr. Thomas Halley, of Pontefract, is in poſſeſſion of ſeventy-three pounds of Rheum Palmatum, or true Rhubarb, as per ſamples 2 and 5, being of the growth of his late father and himſelf, and of his own cure: as witneſs our hands,

THOMAS OXLEY, Apothecary.
WILLIAM TOMLINSON, Grocer.

WILLIAM LAPIDGE, } Perſons employed
HAYFORD BROWN, } in the cultivation
BARTLE HOG, } and cure.

The GOLD MEDAL, being the Premium offered for improving Waſte Moors, was this year adjudged to CHARLES HASSALL, of Eaſtwood, in Pembrokeſhire, Eſq. from whom the following Account and Certificates were received.

SIR,

I WILL thank you for laying the Papers accompanying this, before the Society for the Encouragement of Arts, Manufactures, and Commerce.

The method I have taken to ſtate the management of each field, has been practiſed by me ſome years, and has been found comprehenſive and uſeful in regiſtering paſt, and planning future, operations in farming.

Should the Society approve my endeavours to amend the practice of the plough in this

this remote corner of the kingdom, where the culture of green crops is almoſt in its infancy; I ſhall think myſelf highly honoured by any mark of approbation they may think proper to confer.

I am, SIR,

Your moſt obedient ſervant,

CHARLES HASSELL.

Eaſtwood,
Jan. 15, 1793.

Mr. MORE.

An Account of the Average Expence of cultivating an Acre of Waſte Moor Land, in the poſſeſſion of Mr. Charles Haſſall, *taken at a medium of the whole Property, cultivated by him.*

	£.	s.	d.
Grubbing roots - - - -	1	1	0
Paring ant-hills, &c. - -	0	14	0
Gathering and burning - -	0	2	3
Spreading aſhes - - -	0	1	6
Gathering ſtones - - -	0	0	8
Carried over	£.1	19	5

Brought forward	£.1	19	5
Six carts of lime, four chaldrons, coſt	1	1	0
Carriage of ditto	0	9	0
Spreading lime	0	1	2
One ploughing	0	6	6
Total expence of cultivating one ſtatute acre	£.3	17	1

The lands thus cultivated were, for the moſt part, overgrown with bruſh-wood, furze, and brambles. Some parts were grubbed for fourteen ſhillings a ſtatute acre; and others coſt twenty-five ſhillings: but the general average was about one guinea an acre, as ſtated above.

WE certify, that Mr. Charles Haſſall, of Eaſtwood, in the pariſh of Narbeth, in the county of Pembroke, hath cultivated, and improved, three hundred and thirty acres of Waſte Moor Land, ſituate in the ſame pariſh, and hath encloſed the ſame with

with good quick hedges, and divided it into fields ſufficient for the uſe and occupation of a tenant.

The ſaid land was lately, and before ſuch improvement, abſolutely uncultivated, and in a great meaſure uſeleſs. We have had frequent opportunities of obſerving the cultivation and improvement thereof; and we believe the mode of cultivation, and the expence attending the ſame, as laid down by Mr. Haſſall, in the foregoing account, and in his table, ſigned by us, to be true; and we think the land, ſo cultivated and improved, is worth, at this time, twelve ſhillings per acre.

The proportion of graſs to arable, is about one fourth of graſs, and three fourths arable. Mr. Haſſall intends laying about half the lands down in graſs ſeeds, and is preparing about ſeventy acres for water meadows, for which purpoſe the ſituation ſeems very favourable.

JOHN HERBERT FOLEY.
RICHARD FOLEY.

January 10, 17 93.

AN

IN conſequence of your letter, communicated to us by Mr. Haſſall, we take leave to inform you, that his certificate, relative to a ſcheme of cultivation, carried on at Eaſtwood, was ſigned by,

SIR,

Your humble ſervants,

J. H. FOLEY, of Ridgway, Pembrokeſhire.

RICHARD FOLEY, of Haverford-Weſt.

TWENTY

WENTY GUINEAS, being the pecuniary Premium offered for an improved Hoe, was this year adjudged to Mr. JAMES M'DOUGAL, of Great Windmill-ſtreet, Haymarket; the Hoe, ſent by him, being found on trial to be ſimple in its conſtruction, and to anſwer the purpoſe of a hoe, to be worked by men, in a manner ſuperior to any hitherto known to the Society, for clearing from weeds, and looſening the ſoil, in the intermediate ſpaces of pulſe or grain, ſown in equidiſtant rows, and for earthing up the plants ſufficiently at the ſame time.

A PRINT of this Hoe, ſhewing the conſtruction of it, and the manner f uſing it, is prefixed as a frontiſpiece to his Volume; by which it is evident, hat the Hoe conſiſts of two principal arts; the firſt, a beam of wood, having,

at

at its fore end, a ſemi-circle, forming two handles, between which one man walks and draws the inſtrument forwards: this beam, at the other end, is divided, and moves on two ſmall gudgeons, by which it is accommodated to the height of the hands of the perſon drawing, and room allowed for a wheel to move in.

The other beam is held at its further end by another man, who guides the inſtrument, and regulates its depth in the ground, at the ſame that he aſſiſts its action by thruſting it forward. This beam is alſo divided at its fore end, ſo as to admit a wheel to run between the ſides, which wheel ſerves to adjuſt the depth, and eaſe the draught in working.

The Hoes (properly ſo called) are made of caſt-iron, and fixed in a mortice, in the hinder beam, by a proper wedge, and may be of different forms or dimenſions, as the work to be performed requires.

THIS

THIS is to certify, that we, the underſigned perſons, have ſeen Mr. James M'Dougale's Hoe tried on our ſeveral ſoils, and that it is much more expeditious and effective than any method hitherto practiſed by the hand, for the purpoſes of clearing from weeds, and looſening the ſoil, in the intermediate ſpaces of all crops of corn, ſown in equidiſtant rows; and alſo earths up the young plants at the ſame time: it is alſo made to go deeper occaſionally, by putting the wedge behind the hoe.

WILLIAM MALCOLM.
JAMES MALCOLM.
JAMES FAIRBAIRN, Clapham.
JOHN GLENNY, Batterſea.

SIR,

WITH reſpect to Mr. M'Dougale's hoeing machine, I was preſent at ſeveral experiments made, in my grounds, againſt our common hoes: I think it much exceeds either the common hoe, or any

other hoes that I have ſeen; and as far as a machine of this kind can be applied in hoeing, is infinitely the beſt; in point of cutting the ground, the trueſt, and in the moſt expeditious way.

I am, SIR,

Your moſt humble ſervant,

WILLIAM MALCOLM.

Stockwell Nurſery,
Dec. 17, 1792.

SIR,

I FEEL no difficulty in declaring that, in moſt caſes, where annual crops are ſown, the common hoe, or any other that I have ever ſeen, bears no ſort of compariſon, as to expedition and the effectual manner of its operation, with Mr. M'Dougale's.

I am, SIR,

Your very obliged humble ſervant,

JAMES MALCOLM.

Stockwell Place,
Dec. 17, 1792.

THANKS

THANKS were returned to Mr. HENRY BROWNE, of Derby, for the following communication, relative to the preſerving Seeds from being deſtroyed (when ſown) by Vermin. And it will be highly ſatisfactory to the Society to receive accounts of the ſucceſs of the method hereafter preſcribed, from any perſons who may be induced to make a trial of it.

SIR,

LOOKING over ſome old publications of the Society for the Encouragement of Arts, Manufactures, and Commerce, I find an article relating to the preſervation of grain or ſeed from being deſtroyed by vermin: not knowing whether you have ever had a preſervative communicated to you, I think it my duty to lay before

before you a very ſimple method I have made uſe of for the three laſt years; in which time I have never loſt a ſeed by vermin, although they have burrowed, in a direct line with almoſt every row of peas and beans that have been ſowed. It is nothing more than ſteeping the grain, or ſeed, three or four hours, or a ſufficient time for it to penetrate the ſkin, or huſk, in a ſtrong ſolution of liver of ſulphur. If the above communication is worth notice, and turns out to the leaſt advantage to the community, I ſhall be happy;

And am, SIR,

Your very humble ſervant,

H. BROWNE.

Derby,
March 31, 1793.

PAPERS

IN

MANUFACTURES.

MANUFACTURES.

A Bounty of FIFTEEN GUINEAS was voted to Mr. ROBERT BURT, of Burnham, near Maidenhead, Berks, for his contrivance to be added to the common Spinning-Wheel, whereby the Spinner is enabled, at the ſame time ſhe is ſpinning, to wind off a ball of thread, without any ſenſible addition of labour.

THIS contrivance was principally intended for winding thread for the uſe of ſhoe-makers, but may be applied to other purpoſes; and a ſpinning-wheel, with theſe additional parts, is reſerved in the Society's Repoſitory, for the inſpection

and uſe of the Public. As the Society have, this year, judged proper to offer a Premium for the beſt drawing, by youths, of Mr. Burt's Spinning-Wheel, a plate of it cannot properly be inſerted in this volume, but may make part of ſome future publication.

My Lords and Gentlemen,

I HAVE herewith ſent a Winding and Spinning-Wheel, from my own invention, in hopes you will eſteem and encourage me for my mechaniſm. I am a cordwainer by trade: my mind led me to this invention by my wife's complaining the hemp cut her fingers in winding. I hope, Gentlemen, you will conſider me as an induſtrious mechanick; and pleaſe to ſend me an anſwer, to let me know, when it will be agreeable to the Society for me to attend them, to explain my

my machine; for which I hope they will reward me according to my merit.

I am, SIR,

Your moſt humble ſervant,

ROBERT BURT.

Burnham.

Mr. MORE.

SIR,

I HAVE had the pleaſure to receive your letter of the 22d inſt. I am infinitely obliged to the Gentlemen of the Committee of Manufactures, for having been pleaſed to take into conſideration the merits of the machine I invented for winding of thread, during the time of ſpinning. I do poſitively aſſert the machine to be entirely of my own invention, which I will atteſt, in caſe of the invention being conteſted, before any court of ju-

dicature or magiſtrate required. It is now nearly four years ſince I completed the contrivance; during which time it has been conſtantly uſed by my wife, for the purpoſe of winding thread for the ſhoemakers in the neighbourhood, no ſpinner having a ſimilar mode of winding thread: however, true it is, that I have permitted many perſons to examine the invention. The expence of adding the machinery to the ſpinning-wheel, I conceive, coſt me about eight ſhillings; and, provided a number were ordered to be conſtructed, at the ſame time, with wheels of caſt braſs, or iron, upon my model, I imagine they might be had at about twenty-pence the pound; conſequently the weight muſt eſtabliſh their value, which might be varied, and of which you muſt be a better judge than myſelf.

I hope I have replied to your queſtions, in a manner that will prove ſatisfactory to

to the Gentlemen of the Committee: if not, ſhall be happy to reply to any further queſtions they may have to propoſe to me.

I am, SIR,

Your moſt obedient humble ſervant,

ROBERT BURT.

Burnham, Bucks,
Feb. 24, 1793.

Mr. MORE.

TWENTY GUINEAS were this year voted to Mr. JOHN ANTIS, of Fulneck, near Leeds, for his ingenious method of cauſing the bobbin of the common Spinning-wheel to move backward and forward; by which means, the time loſt by ſtopping the wheel, to ſhift the thread from one ſtaple, on the flyer, to another, as has hitherto conſtantly been practiſed, is avoided; the danger of breaking the thread and looſing the end, obviated; and the ſpinner enabled to do much more work, in a given time, than by any common ſpinning-wheel hitherto in uſe.

The annexed Plate will explain the mechaniſm by which this effect is produced: and a ſpinning-wheel, with the additional parts, is reſerved in the Repoſitory of the Society, for the uſe of the Public.

SIR,

SIR,

SINCE my return home, I have put in practice the idea which I imperfectly explained to you, of making the bobbin of the common ſpinning-wheel move backwards and forwards, in order to avoid the continual interruption, by changing the hooks, as is neceſſary with the old wheels: and I have the ſatisfaction to ſay, that it anſwers the utmoſt of my expectation. It would add a mere trifle to the expence of a new wheel, if made ſo from the beginning; but it may alſo eaſily be added to old wheels, of whatever conſtruction they may be. I had it tried by a lady here, who ſometimes ſpins for her diverſion, who was much pleaſed with the invention, and thought it might ſave a perſon at leaſt two hours, if not more, in a day; which would be a great object for poor people. I propoſe ſending the wheel next week for the inſpection

tion of the Society, who will be beſt able to judge of the utility it may be to the public: to ſerve which, will always be a great ſatisfaction to,

SIR,

Your moſt obedient humble ſervant,

JOHN ANTIS.

Fulneck,
March 29, 1793.

Mr. MORE.

SIR,

THIS is to inform, that I have not had an opportunity till this day to ſend the ſpinning-wheel, with the improvements; which is encloſed in a box, directed to you. It goes by the Leeds waggon, which puts up at the Bull-and-Mouth Inn, London. and will arrive there on the 15th or 16th inſtant.

Having

Having had opportunity to try it ſufficiently, I do not at all doubt but it will anſwer. I made every thing as ſimple as poſſible; ſo that it might be in the pooreſt perſon's power to obtain it; and ſtill it could be more ſo: for had I had a turner at hand, I would have made all on the wheel of wood; for a good piece of hard ſycamore might have been ſo contrived, that, inſtead of the iron wire on the wheel, a rim might have been left ſtanding, and cut in the ſame ſhape, which would anſwer as well: only, in that caſe, the pin on the lever would be better if it were a roller. There is a ſmall lead weight, which goes over a pulley, and inclines the bobbin always one way; all which you will find eaſily.

The invention has alſo this advantage; that, whereas, at beſt, the old method always winds in ridges, if a thread breaks, by reeling the yarn, one may as well throw the whole bobbin away, as the thread cannot eaſily be found again: but this always winds

winds it acroſs upon one another; by which means the thread can never be loſt.

I remain, SIR,

Your moſt humble ſervant,

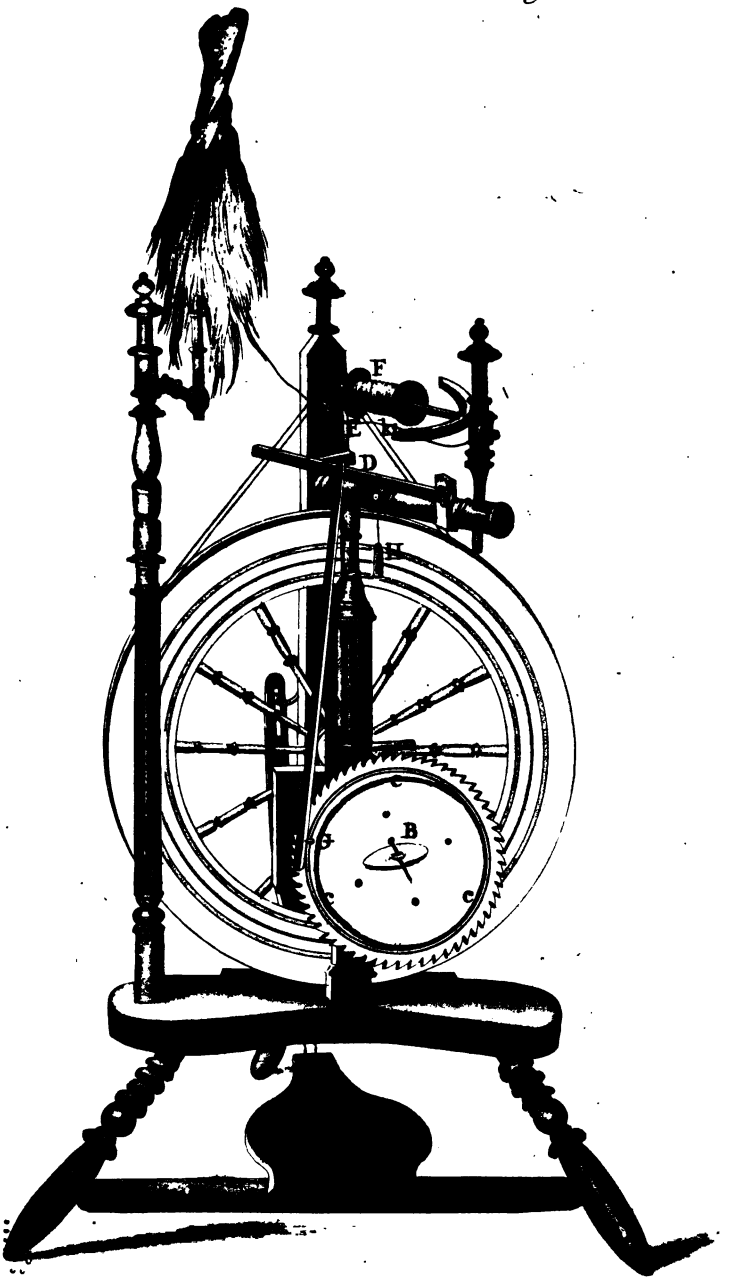
JOHN ANTIS.

Fulneck,
April 10, 1793.

Explanation of the Plate of Mr. ANTIS's *improved* SPINNING-WHEEL.

THE method of cauſing the bobbin to move backward and forward (which is the improvement here meant to be ſhown) is effected by the axis of the great wheel being extended through the pillar next the ſpinner, and formed into a pinion of one leaf, A, which takes into a wheel, B, ſeven inches diameter, having on its periphery ninety-ſeven teeth; ſo that ninety-ſeven revolutions of the great wheel cauſe one of the leſſer wheel. On this leſſer wheel is fixed a ring of wire, *ccc*; which, being ſupported

Mr. Antis's improved Spinning Wheel.



ſupported on ſix legs, ſtands obliquely to the wheel itſelf, touching it at one part, and projecting nearly three quarters of an inch at the oppoſite one: near the ſide of this wheel, is an upright lever, C, about fifteen inches long, moving on a centre, three inches from its lower extremity, and connected at the top to a ſliding bar, D; from which riſes an upright piece of braſs, E, which, working in the notch of a pulley, drives the bobbin, F, backward and forward, according as the oblique wire forces a pin, G, in or out, as the wheel moves round. To regulate and aſſiſt the alternate motion, a weight, H, hangs by a line to the ſliding bar, and, paſſing over a pulley, I, riſes and falls, as the bobbin advances or recedes, and tends conſtantly to keep the pin in contact with the wire. It is evident, from this deſcription, that one ſtaple only is wanted to the flyer, which, being placed near the extremity, K, the thread paſſing through it, is, by the motion of the bobbin, laid regularly thereon.

Mr.

PAPERS

IN

MECHANICKS.

MECHANICKS.

Mr. STEPHEN KENDRICK, of Cheines-ſtreet, Bedford-ſquare, having preſented to the Society a Gudgeon, on an improved conſtruction, for the upright Shafts of Mills, the SILVER MEDAL was voted to him; and the Gudgeon, with its box, reſerved in the Society's Repoſitory, for the uſe of the Public.

Deſcription of Mr. Kendrick's GUDGEON.

THIS Gudgeon is formed of hard ſteel, and works on a hard ſteel bed; is circular, three inches diameter, and three-fourths of an inch thick: from its upper

ſide a rib projects, which, being fixed in the bottom of an upright ſhaft, the Gudgeon works horizontally on a ſquare bed: and that now in the poſſeſſion of the Society has worked in a mill whoſe wheel and ſhaft weighed nearly ſix tons; and, though it had continued in work ſeven years, had loſt very little of its ſurface. It ran in a ſquare box of caſt iron, having oil therein; and a notch along the whole of the face of the Gudgeon admits the oil to inſinuate itſelf between the Gudgeon and the bed.

The

The SILVER MEDAL was this year voted to GEORGE QUAYLE, Eſq. for his invention of a Pentrough, for equalizing the water falling on water-wheels; of which a Plate and Deſcription is annexed, and a complete Model reſerved in the Society's Repoſitory.

SIR,

IN all mills worked by water, ſome inconvenience is found to ariſe from the irregularity of ſpeed, occaſioned by the variation of the head of water at the Pentrough. The ſpecific weight being neceſſarily proportioned to the perpendicular altitude of the water, its velocity is increaſed by a greater, and diminiſhed by a leſs head. No accurate judgment as to the quantity really admitted, can be formed, from the poſition of the ſhuttle. The ſpace only is regulated by this; but the quantity of water

paſſing through that ſpace depends on its ſpecific gravity, in proportion to which its courſe is accelerated: beſides, where the race is of any conſiderable length, the rain-water which falls into it, and that which gains admiſſion from the adjoining lands, baffles all calculation, as to the quantity really paſſing into the dam or reſervoir: and the ſhuttles at the dam head are ſubject to the ſame evil. Any irregularity in the head of water falling on the wheel is of courſe communicated to the internal machinery; from whence much inconvenience muſt ariſe in all manufactories where preciſion in the movements is requiſite; and particularly thoſe of ſilk and cotton.

The giving an even, regular motion to water-wheels, appears therefore a deſideratum in hydraulics. It can only, I conceive, be obtained by equalizing the quantity of water falling on the wheel; but whilſt the uſual ſyſtem is purſued, of delivering it from the bottom of the Pentrough, it does not appear eaſy to ſuggeſt means

means by which all irregularity can be prevented.

In order to remedy this inconvenience, and insure a constantly-regular supply of water on the wheel, it appeared to me, that means might be devised of regulating the quantity delivered, by a float, and taking the whole of the water from the surface.

After several experiments, the machine of which I have now the honour of sending you a sketch and description enclosed, and of which a model accompanies this letter, bids fair to answer the purpose.

Another advantage attends the use of this shuttle: room may be saved in the extent of the dam, as the water may be suffered to rise to a greater height, without the inconvenience attending the increased velocity of its discharge. In cases also of temporary deficiency, the water which remains, will, by this means, be worked to the greatest advantage.

I beg you will have the goodneſs to lay the model and deſcription before the Society, and am reſpectfully,

SIR,

Your moſt obedient ſervant,

GEORGE QUAYLE.

London,
April 18, 1792.

Mr. MORE.

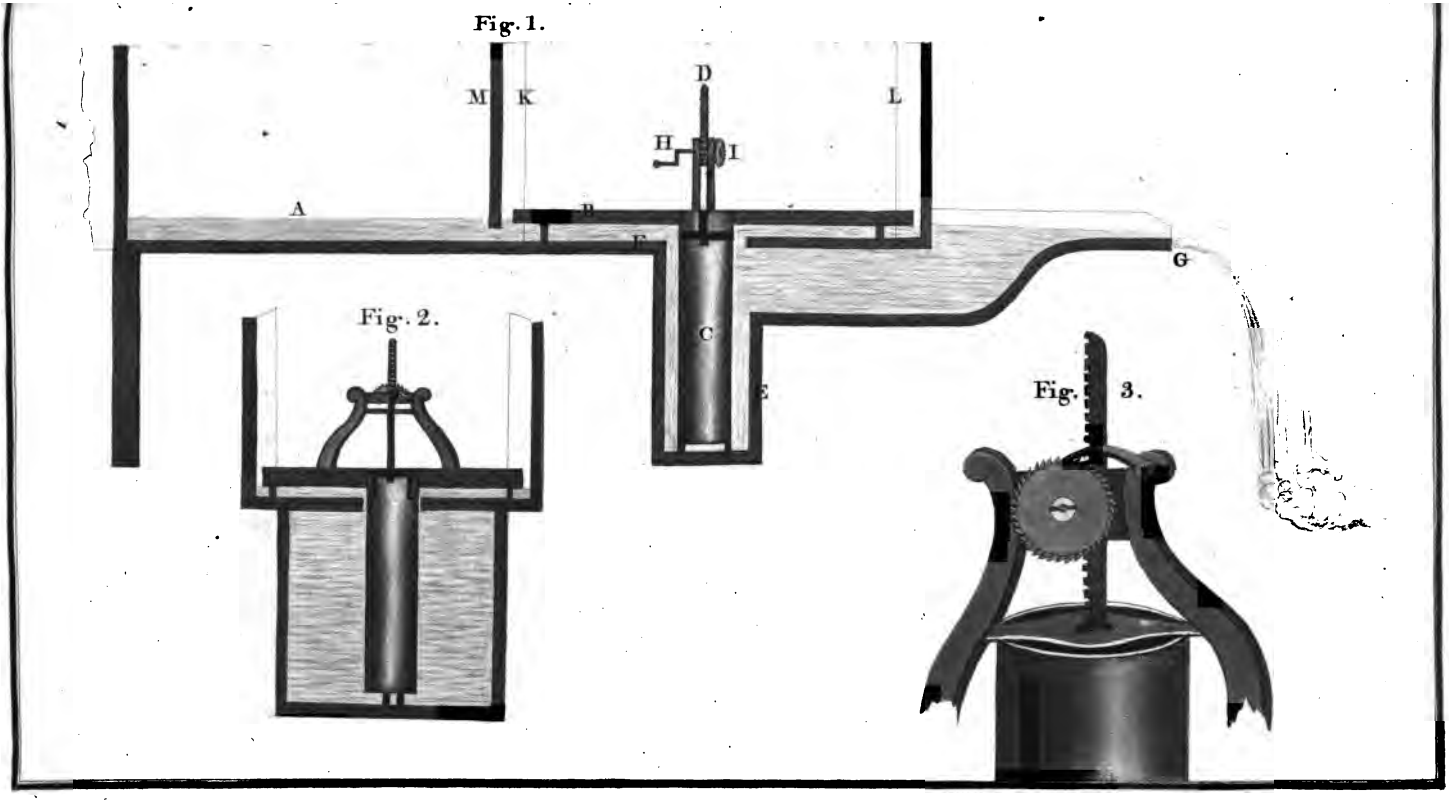
SECTION of the PENTROUGH.

FIGURE I.

A, The entrance of the water.

B, The float, having a circular aperture in the centre; in which is ſuſpended

C, A cylinder, running down in the caſe E, below the bottom of the pentrough. This is made water tight, at the bottom of the pentrough, at F, by a leather collar placed



Mr. Quayle's Pentrough for equalizing Water on Water Wheels.

placed between two plates, and ſcrewed down to the bottom.

The cylinder is ſecured to the float ſo as to follow its riſe and fall; and the water is admitted into it through the opening in its ſides, and there, paſſing through the box or caſe E, riſes and iſſues at G, on the wheel. By this means, a uniform quantity of water is obtained at G; which quantity can be increaſed or diminiſhed by the aſſiſtance of a ſmall rack and pinion attached to the cylinder, which will raiſe or depreſs the cylinder above or under the water line of the float; and, by raiſing it up to the top, it ſtops the water entirely, and anſwers the purpoſe of the common ſhuttle. This pinion is turned by the handle H, ſimilar to a winch-handle; and is ſecured from running down by a ratchet wheel, at the oppoſite end of the pinion axis.

K and L are two upright rods, to preſerve the perpendicular riſe and ſinking of the float, running through the float, and

ſecured at the top by brackets from the ſides.

M, A board let down acroſs the pentrough, nearly to the bottom, to prevent the horizontal impulſe of the water from diſturbing the float.

FIGURE II.

A croſs ſection, ſhowing the mode of fixing the rack and pinion, and their ſupports, on the float. The rack is inſerted into a piece of metal running acroſs the cylinder, near the top.

That the water may paſs more freely, when nearly exhauſted, the bottom of the cylinder is not a plane, but is cut away ſo as to leave two feet, as at C, Fig. I.

The float is alſo kept from lying on the pentrough bottom, by four ſmall feet; ſo that the water gets under it regularly from the firſt.

FIGURE

FIGURE III.

An enlarged view of the cylinder, ſhewing the rack and ratchet wheel, with the click, and one of the openings on the ſide of the cylinder: the winch, or handle, being on the oppoſite ſide, and the pinion, by which the rack is raiſed, incloſed in a box between them.

The ſcale of the model is one inch to a foot.

The annexed figures are reduced to one ſixth.

It being conſidered that, in the erection of large works, a method of laying the weight, ſuſpended by a crane, in any ſituation, within the ſpace of a ſemi-circle, whoſe radius is nearly equal to the length of the gib, will prove of conſiderable uſe, particularly in large buildings, as piers, &c. a Bounty of TWENTY GUINEAS was voted to Mr. RICHARD JOHNSON, for his invention of a Crane to anſwer that purpoſe (ſee the plate annexed), a complete model of which is reſerved in the Society's Repoſitory.

SIR,

I HAVE invented an engine for heavy work, ſuch as piers and ſtaiths: it is a Compound Crane, moves in a ſemi-circle, will take up a ſtone, and carry it to any part of the building, that lies within the range

range of the gib, and will bring a ſtone within three feet of the centre of the crane: it was originally deſigned for the uſe of a pier building here: the work going on ſo very ſlow, gave riſe to the thought. I have the model by me, half an inch to a foot, which I can ſend for your inſpection: ſeveral gentlemen who have ſeen it, ſay it is original.

I hope you will excuſe the freedom hereof; but the recommendation of ſome friends here, induced me to apply to you; and if you will give me leave to ſend the model to you, its action may be better underſtood by inſpection than by deſcription. I flatter myſelf it will merit the approbation of the Society, and may be of public utility.

I am, SIR,

Your obliged humble ſervant,

RICHARD JOHNSON.

Scarborough.

Mr. MORE.

SIR,

SIR,

BY the Active Packet, Captain Chambers, who ſailed for London this day, you will receive Mr. Richard Johnſon's model of a Compound Crane, which, when properly made, he ſuppoſes, would have very much expedited the building of the new pier at this place. That pier is principally conſtructed with ſtones, from ten to thirty tons weight; and by their preſent manner of raiſing and placing them, the work advances very ſlowly.

I am, SIR,

Your moſt humble ſervant,

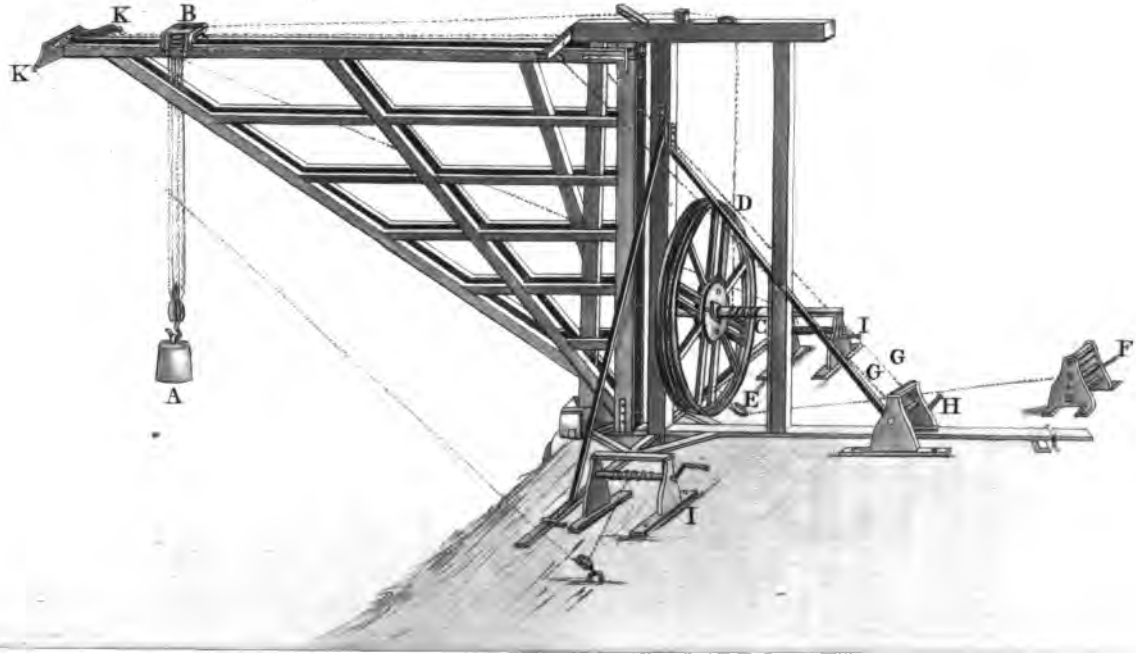
JOHN TRAVIS.

Scarborough.

Mr. MORE.

Deſcription

Mr. Johnson's double gibbed Crane.



Deſcription of the Plate of Mr. JOHNSON'S *double-gibbed Crane, ſo called from the Gib being compoſed of two Frames, connected together at each end; and admitting the ropes and lower block, by which the weight is ſuſpended, to run between them.*

A, the weight ſuſpended. B, the upper block moving on the top of the gib, and drawn backward or forward by two ropes. GG, winding in different directions on an arbor at H. The weight and lower block are raiſed or lowered by a rope, winding on or off the axis C; and the power is increaſed by a rope winding round a large wheel D, fixed on the axis C, which is wound round an arbor, turned by a winch at F. To turn the gib to the right or the left, there are two arbors turned by winches at I I: round theſe arbors, ropes from the extremity of the gib K K, paſſing through proper ſnatchblocks, are wound; the one of the ropes being ſlackened, while the other

other is drawn in according to the movement intended; and thus the horizontal motion of the whole gib is obtained, and the weight A may be depoſited on any ſpot required, within the range of the gib. Two friction wheels are placed on each ſide the upper block, which not only ſerve to clip the top of the gib, and thus prevent the block, by any accident, ſlipping off, but facilitate its motion along the upper part of the gib.

Captain

CAPTAIN EDWARD PAKENHAM, to whom the Public is already ſo much obliged for his attention to the ſafety of ſhips, particularly when either their rudders or maſts are injured (ſee the papers on thoſe ſubjects in the VIIth and Xth Volumes of theſe Tranſactions), has this year again favoured the Society with a model, ſhewing an eaſy, ſafe, and certain method of preventing a ſhip's rudder being totally loſt, ſhould the pintles and braces, on which it moves, be entirely broken: and in a ſubſequent letter, having alſo communicated, in addition to the mode contrived by him, for preventing the total loſs of a rudder, a mode of preventing a rudder beating about, in caſe the tiller is broken; Thanks were given to CAPTAIN PAKENHAM for theſe communications. And the following letters, and the annexed plate, will fully ſhew the method preſcribed by

by him for thoſe uſeful and neceſſary purpoſes. The models above alluded to are reſerved in the Society's Repoſitory, for the uſe of the Public.

SIR,

MY former attempts to ſupply the loſs of a ſhip's rudder, having been ſo fortunate as to meet the Society's approbation, I have now the pleaſure to preſent them with a model, and a deſcription of a plan, to prevent the total loſs of the rudder; and as it has met the approbation of many of our firſt practical ſeamen, I flatter myſelf, it will be found to anſwer the end propoſed, as it is fitted without any inconveniency, trouble, or expence; and calculated to benefit all ſhips that have two rudder heads, or two holes for the tiller, which is the caſe with all men of war and Indiamen.

As it is from misfortune chiefly that experimental knowledge is gained at ſea, when

when combating with contending elements, and each hour aggravating former calamity; the mariner, thus furniſhed with one great reſource, may find his ideas ſtrengthened by exigency, and ſurmount, with eaſe, other ſurrounding dangers. But the frequent diſaſters which have hitherto happened, point out the neceſſity of ſome certain plan, to prevent this misfortune: for it is a juſt and true remark, Sir, that few ſhips beat off their rudder, by ſtriking on the ground, without loſing them altogether; ſuch was the caſe with the Royal George, and Namur, in Torbay; the Warrior, Repulſe, Torbay, Porcupine, and the Endymion, in the Weſt Indies; and the Guardian, off the Cape: theſe are home to the recollection of preſent memory, beſides various other inſtances in the mercantile line.

I have obſerved that foreign veſſels in general endeavour to guard againſt loſing the rudder altogether, but their attempts hitherto have been ineffectual: their plan

is to have a ſtrap of rope from the main-piece of the rudder to a hole in the ſtern-poſt, at the water's edge; but this expedient has always proved of ſmall avail; for, without doubt, the violence which can ſo ſhatter and deſtroy the iron work, will unavoidably carry away the ſtrap: not to bring forward any idea of its being chafed and rotten in long voyages. The Ville de Paris, and all the prizes captured on the 12th of April, had this rope ſtrapped.

My plan, you will obſerve, Sir, is calculated to ſave the rudder, when it is beat off, and ſerves likewiſe to keep it in its proper place; for it is remarked, that no iron work (that is, the pintles and gudgeons) can withſtand the violence of the ſhip's ſtriking the ground: therefore, when the iron work is carried away, it follows that the fid will ſtill ſupport the rudder, by reſting on the comings, and act as an upper gudgeon; nor indeed can any thing force it away, unleſs the rudder is beat all to pieces, which is very ſeldom the caſe; but,

but, ſhould that happen, the mariner will have a reſource in my former ſubſtitute. I would recommend additional rudder-pendants, when the rudder is beat off, which is eaſily done, by clinching hawſers round the rudder, on each ſide the ſhip, and ſlipped well down the rudder, to keep the lower part as quiet as poſſible; but this, and many other precautions, I have no occaſion to point out, as they will occur to the mariner himſelf, after he has been ſo fortunate as to ſave his rudder.

Having therefore perfectly convinced myſelf, that it is calculated to anſwer the end propoſed, permit me to obſerve, Sir, that this reaſon has been a powerful inducement with me, in introducing it to the notice of the Society; forming an early wiſh, that its eaſe and ſimplicity of conſtruction may become as diffuſive as poſſible.

In the Society's making public uſe of the plan, my original intention will be

amply anſwered; my pride as an officer, and my feeling as a member of the community receiving equal gratification. I have the honour to be, with reſpect,

SIR,

Your moſt obedient

And humble ſervant,

EDWARD PAKENHAM.

Crown Street,
Nov. 12, 1792.

Mr. MORE.

SIR,

IN addition to the deſcription I have given of a method to prevent the total loſs of a ſhip's rudder, I beg leave to communicate ſome ideas which have ſince occurred to me, for keeping a rudder quiet, if the tiller ſhould be carried away in a gale of wind, and which, I am taught to believe, is of ſufficient importance to claim peculiar attention.

It

It has hitherto been the cuſtom, in a gale of wind, when a tiller is broken, to endeavour to ſteady the rudder, and prevent the violence of the ſea from doing it prejudice, by letting down chocks or wedges; but this method muſt neceſſarily be liable to endanger it, by ſtraining the pintles and gudgeons; conſequently, to the great diſtreſs of many ſhips deeply laden, has never been found to anſwer the deſired purpoſe.

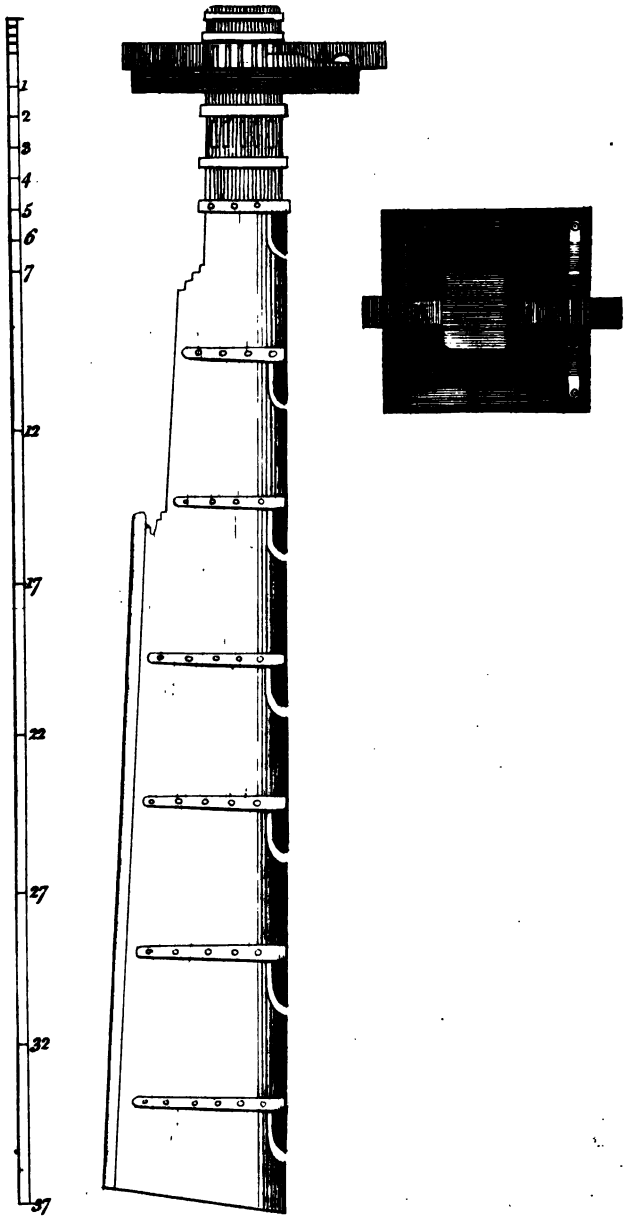
The model that accompanied my former plan has a coming pertaining to it, for admitting a fid, which goes through the ſpare tiller-hole to reſt upon, and which, I preſume, will be ſufficient to ſuſtain the rudder, when unſhipped: but as it has been found, upon any unforeſeen occurrence at ſea, which threatens immediate danger, that the human mind, although able to brave and ſurmount every danger and difficulty, has not always been capable to adopt the moſt ſpeedy and cer-

tain remedy, I truſt this further improvement will be found ſimple, eaſy, and effectual.

I propoſe, that the coming, which incloſes the head of the rudder, ſhall have holes, bored at convenient diſtances, to receive bolts or palls, of between two and four inches in diameter, and about fifteen inches in length, according to the ſize of the ſhip: theſe bolts being placed on each ſide of the fid, when occaſion requires, will confine the helm in any poſition, and not only give an opportunity to ſhift a tiller, but will likewiſe, if neceſſary, take off any ſtrain from it when lying-to.

The earneſt deſire I entertain of being uſeful to the community, leads me to ſubmit theſe thoughts to the Society; and as they have conſtantly ſhewn particular attention to whatever tends to public utility, I am induced to believe, that my efforts

A Plan by Capt.n Edw.d Pakenham, to prevent a Ship's Rudder being lost.



efforts will be favourably received, conſidering its uſe, when applied to deep-laden merchant ſhips, labouring in a heavy ſea.

I am, with great reſpect,

SIR,

Your moſt obliged humble ſervant,

EDWARD PAKENHAM.

Crown Street,
Jan. 15, 1793.

Mr. MORE.

Explanation of the Plate of CAPTAIN PAKENHAM'S RUDDER.

A. A ſquare fid made to fit the upper hole of the rudder, and bolted through the rudder head.

B. A coming, fitted round the rudder-hole, and well ſecured to the deck, for

the fid to work on, and acting as an upper gudgeon, in caſe the pintles are beaten off.

C. Palls bolted through the fore-part of the coming, to quiet the rudder, in the room of chocks, in caſe the tiller ſhould be carried away.

The Society having this year received from Mr. JOHN BELL, Serjeant in the Royal Regiment of Artillery, a Gun and Harpoon on a new conſtruction, for taking Whales, ſatisfactory trials were made therewith, and a Bounty of TWENTY GUINEAS voted to him for his improvements, which are ſhewn in the annexed Plate; and a model, as mentioned in the following Paper, reſerved in the Society's Repoſitory.

SIR,

HAVING reſumed the buſineſs of the Harpoon-gun, on which I have made ſeveral experiments, I have the pleaſure to acquaint you, that the reſult anſwers my fulleſt expectations.

I have taken the liberty of ſending it, with the carriage, to the Repoſitory of the Society,

Society, and beg the favour, when convenient, you will pleaſe to mention it to the Members. I will attend their pleaſure, at any future period, in order to explain the manner of its application.

I am, SIR,

Your much obliged

And obedient humble ſervant,

JOHN BELL.

Woolwich,
Jan. 13, 1793.

Obſervations on throwing a Gun-Harpoon.

Firſt, in order to ſtrike an object, at the diſtance of about ſixty feet, requires no leſs an angle than five degrees elevation; from which the gun's poſition then is ſuch as wholly to obſtruct the perſon uſing her, from pointing out any true line of direction: likewiſe the proper elevation can be no other than a ſuppoſition.

To

To remedy this, a tangent diſpart is permanently fixed at the muzzle of the gun. The vertical lines ſhow the line of direction; and the horizontal lines, the required elevation: which is explained in the following manner, viz. The front horizontal line, and the under part of the rear cut, and the baſe ring of the gun, are parallels; ſo that an object ſeen upon the ſame level with the metal, would be ſtruck with the harpoon at about thirty feet diſtance; then the coin being drawn back, until the under horizontal line of the rear cut interſects the front line and the object, it would then be ſtruck at the diſtance of about ſixty feet; and when the upper line of the rear cut interſects the front line and the object, it would be ſtruck at the diſtance of about ninety feet: ſo that any intermediate diſtance between thoſe mentioned, muſt depend on the perſon's judgment in uſing the gun. For inſtance, ſuppoſe the diſtance to be from 70 to 80 feet; then bring the front line and a middle ſpace between the two rear lines and the object in view.

The

The ſame rule muſt be obſerved for any diſtance under ſixty feet.

Secondly, Appropriating two locks inſures a more certain fire; and ſhould both locks take, the powder muſt be more equally inflamed.

Thirdly, Coiling the line in the front locker prevents it from getting entangled: likewiſe, in traverſing the gun to the right or left, as occaſion may require, the line is moved with it; which alſo prevents the harpoon, in its flight, from being influenced by the weight of the line out of its proper direction; which muſt otherwiſe be the caſe, where the line lays upon one ſide of the metal. From this it may not be improper to obſerve, that, in nearing the intended object, attention ſhould always be paid, to endeavour, as much as poſſible, to be ſo ſituated, that the wind blows either a-head or ſtern of the boat at the time of firing; for a ſtrong wind will ſenſibly alter the harpoon's line of direction, from the

power

power it has upon the line, as its length increaſes from off the locker. The two ſmall pins at the front of the locker are to keep the coil in (on a rough ſea), which are to be thrown out before firing: but ſhould this be neglected, no other damage will enſue, than bending the pins a little, by the friction of the ropes running out.

Fourthly, From experiment, it is found, that the gun, when loaded with twelve drams of powder, and a harpoon weighing between five and ſix pounds, is fired, the re-action upon the metal is conſiderably more violent than when loaded with a ſervice charge of powder and ſhot. In order to prevent any accidents which might happen, by the iron pin of the carriage giving way, from ſo ſudden a ſhock, a breechen is made faſt, from the ſliding carriage, to the head of the boat, and properly ſecured: the gun being fired, the elaſticity of the breechen permits her to recoil about two inches, which certainly is a much leſs ſtrain to the boat, and a ſafer method of

uſing

uſing the gun; for, allowing the breeches to break, there is then the ſame principle of the iron pin to be depended upon, as at preſent.

Fifthly, The wooden tube which encircles the ſhank of the harpoon, is driven off from the muzzle of the gun, on the firſt impulſe; ſo that the line can receive no injury from the fire; and the harpoon meets with but a ſmall check, from the collar and ſhackle, and of courſe muſt preſerve in its flight a more uniform line of direction, and angle of elevation.

Sixthly, Attention ſhould be paid to keep the powder in good order. If a doubt ſhould ariſe of that nature, place a ſmall portion of it on the hand; and if, in ſhaking it off again, a quantity of duſt remains on the ſkin, it indicates the powder having imbibed moiſture. To remedy this, take a clean glazed earthen pan, and warm it upon a fire, ſo that the hand can bear to touch it; then wipe it, and remove it to a

proper

M. Bell's improved Gun and Harpoon.

Fig. 2.

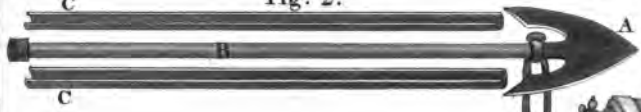
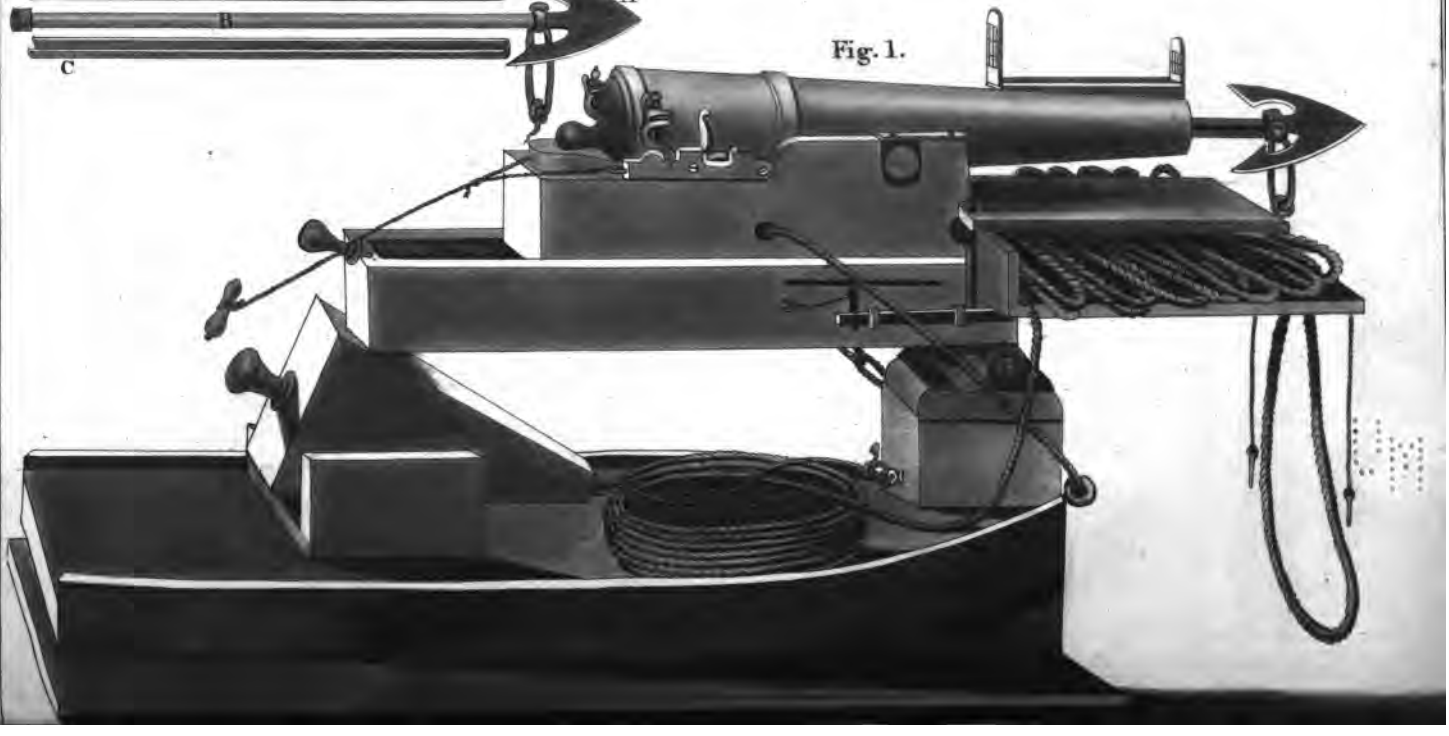


Fig. 1.



proper place, throwing a few ounces of powder into it; which will in a few minutes become dry; conſequently, will act more quick and violent.

JOHN BELL,
Serjeant of the Royal Regiment of Artillery.

N. B. A model of the Gun and Harpoon complete is reſerved in the Society's Repoſitory, made to a ſcale of ſix inches to a foot.

Deſcription of the Plate of Mr. BELL's *improved* GUN *and* HARPOON.

FIGURE I.

The Gun fitted for firing.

FIGURE II.

The form of the Harpoon. The head of this harpoon, A, is of the uſual ſhape; from

from whence runs a ſhank B, terminating, at the other end, in the form of a cylinder ſhot. A piece of aſh, or other wood, *cc*, is turned, of a due ſize, and length of the bore, to fill the calibre of the gun when the charge is in; and, being ſawed in half, lengthways, a hollow is ploughed in each piece, to clip the ſhank of the harpoon: thus the whole bore of the gun is filled; and, on the diſcharge, the ring to which the rope or fore-ganger is affixed, ſtrikes againſt the cylinder ſhot, with its force ſo much abated as to prevent any danger of breaking the ring.

The

The SILVER MEDAL was voted to Mr. THOMAS COLLEY, of Gregynog, near Newtown, Montgomeryſhire, for his contrivance for locking Carts in deſcending ſteep hills; ſome account of which is contained in the following letter, and the model mentioned therein reſerved in the Society's collection for the uſe of the public; and, in order to make it more clear, a cut of the Locking Pole is given.

SIR,

WHEN I had the pleaſure of an interview with you laſt, I mentioned having invented a lock for two-wheeled carts, which has been found extremely uſeful in this mountainous neighbourhood, as well as in particular ſituations in the adjoining county, Salop, where I have recommended the uſe of it.

Having been witneſs to ſome diſtreſſing misfortunes, occaſioned by the uſual modes of preventing a loaded cart overpowering the ſhaft-horſe, in deſcending hills, I was induced to attempt a removal of the inconvenience; in which experience proves I have been ſucceſsful: for, after ſeven years uſe of theſe locking-poles, I have not heard of any accident having happened in that reſpect: and though ſome of our roads have elevation of ten degrees, it is found that carts deſcend them with as much eaſe and ſafety as waggons having both the hinder wheels locked, with only one exception; and that is, where the ruts are deep and ſtoney (which is ſeldom the caſe in ſuch ſituations), a little more care is required of the carter, leſt the point of the locking-pole ſhould meet with a ſudden reſiſtance, and by that means overturn the cart.

Learning from you, Sir, that the Society for the Encouragement of Arts, Manufactures, and Commerce, are ever ready to receive intimations of real improvements, however

however ſmall they may be; and being deſirous that this ſimple and cheap invention may be made more generally uſeful; I have ſent, by the Salop waggon, directed to you, a caſe containing ſomething like a cart, in miniature, with a locking-pole fixed to the wheel, as when in uſe: by placing which on an inclined plane, you will better underſtand how it operates, than by any drawing I could make.

You will pleaſe to obſerve, that, in order to have the locking-pole ſecure from breaking, it ſhould be made of aſh, which grew very near its form, particularly at the lower crook, and ironed as the model. The butt or ſtem of an aſh-tree, having the ſpurns* left to it in felling, I find, makes the beſt; and ſeveral may be ſawed out of the ſame tree, if of a moderate ſize, and the ſpurns grew ſuitably.

In the uſe of the locking-pole, one thing muſt be obſerved, which may not occur on firſt trial, i. e. If a horſe is put into the

* The beginning of the roots.

ſhafts, that has been uſed to that ſituation, and to deſcents, he will, as uſual, be ſo much inclined to hold back, that it will be found difficult to make him draw, which it is quite neceſſary he ſhould do; otherwiſe, the chain-horſe, which ſhould always be linked to the locked ſide, will have too much to draw, and being ſo much below the point of the ſhafts, it will occaſion unneceſſary weight to that horſe.

In order to convey the locking-pole from one ſteep to another, it is placed between the under-ſide of the cart and the axle-tree, and the ſmaller end buckled with a ſtrap, which you will obſerve under the cart, on the driving ſide.

The ſcale ſent with the model is that by which it was made: though the London carts are much larger than thoſe uſed here; and the nine inch wheels occaſion much more friction, when locked, than our ſix inch: yet I truſt a locking pole, made of proportionable dimenſions to the model, of

a proper piece of timber, and ſtrengthened with iron, will be adequate to the weight of a load on any deſcent.

I have now, Sir, only to ſay, that I hope you will, from the model and this deſcription, perfectly underſtand, and on trial be fully ſatisfied of, the uſe of this invention: and if the Society ſhall deem it worthy a place in their Repoſitory, I ſhall be highly gratified; and am, with reſpect,

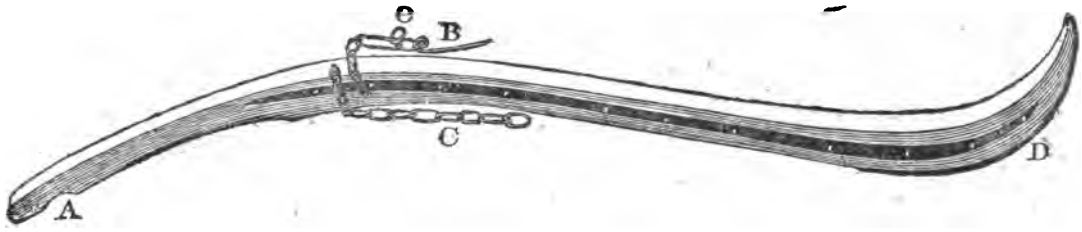
SIR,

Your obliged humble ſervant,

THOMAS COLLEY.

Gregynog, near Newtown, Montgomeryſhire, October 31, 1792.

Mr. MORE.



Explanation of the Cut of Mr. Colley's LOCKING-POLE.

A, The hollow, which lies on the nave of the wheel.

B, C, The chains which clip the felly of the wheel.

D, The front part of the pole, ſhod with iron.

To ſtrengthen the pole, a rib of iron is alſo rivetted along the ſide of it, as expreſſed by the black line.

When the chain C is put round the felly of the wheel, the pin at B being paſſed through the outermoſt link of C, and turned back through the moveable ring, e, the wheel is thus held faſt.

A Bounty of FIFTEEN GUINEAS was given to Mr. DIXON, for his contrivance of a Preſervative Wheel, to be fixed to a Walking-Wheel Crane; whereby the ſafety of the men is inſured, ſhould the weight at any time overcome the power, as is too frequently known to be the caſe—ſee the Plate. A Model is alſo reſerved in the Society's Repoſitory.

MY LORDS AND GENTLEMEN,

IT is well known that numbers of unfortunate men have loſt their lives by working on the quays, in the Wheel Cranes, by their recanting back, when overpowered by the weight craning up; and having no means whereby to ſave themſeves, have inevitably fallen a ſacrifice: it has long been my conſtant ſtudy to contrive ſome method to prevent thoſe fatal misfortunes; which I have length accompliſhed, in what

I call the Preſervative Wheel; and I am now happy in offering it to your inſpection, and hope it will meet your approbation. The preſervative wheels are fixed to the axis of the wheel; over which paſs two ropes, ſuſpending a bar of wood, for the men to lay hold of, when overpowered, and by which they may ſuſpend themſelves with the greateſt ſafety, till all danger is paſt. Pulleys are placed near the periphery of each of the preſervative wheels; over which the ropes run, and are thereby prevented taking fire by the friction. The preſervative wheels are made in two parts, in order that they may be fixed to any crane already erected. I am,

My Lords and Gentlemen,

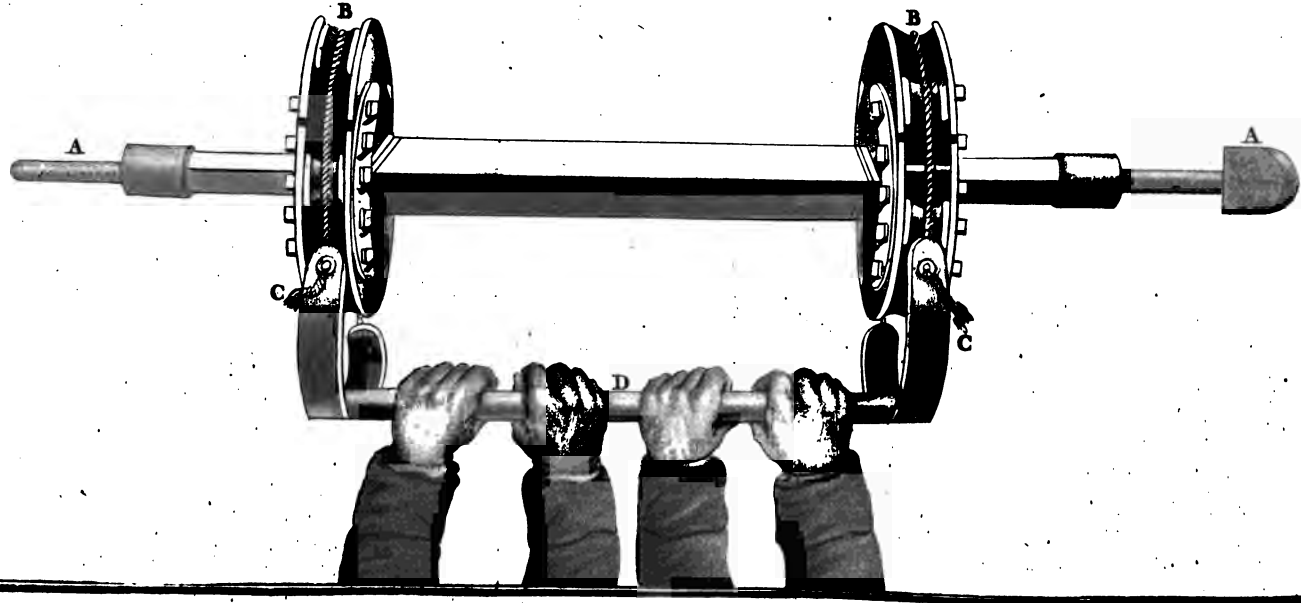
Your moſt obedient humble ſervant,

JOSEPH DIXON.

No. 1, Moore's Yard, Old Fiſh-ſtreet.

To the Society for Encouragement of Arts, Manufactures, and Commerce.

M.Duron's contrivance for preventing accidents in Wheel Cranes.



[illegible]ANICKS.

[illegible] of the Plate of Mr. DIXON's [illegible]TRIVANCE, for [illegible] CRANES.

[illegible] together [illegible]

Explanation of the Plate of Mr. DIXON'S CONTRIVANCE, *for preventing Accidents in* WHEEL CRANES.

A. A. The axis or ſpindle of the walking wheel. B. B. Two preſervative wheels fixed on the axis, and having near their peripheries ſix pullies, over which ropes run, that are faſtened, at their extremities, to two ſegments of circles C. C. Theſe are united together by a wooden bar D, which the men are to lay hold of, as expreſſed in the figure, and ſuſpend themſelves by, in caſe of danger.

PAPERS IN COLONIES AND TRADE.

THANKS were returned to DR. DANCER for the following communications, relative to the growth of Cinnamon in Jamaica, and other ſubjects mentioned therein, which have been recommended to his attention by the Society, particularly with reſpect to obtaining a kind of Barilla or Kelp, from ſome of the maritime plants of that Iſland, which may hereafter prove a valuable article of importation.

SIR,

I AM juſt favoured with your letter of the 19th of January, by the Jupiter, and cannot omit the opportunity which offers

offers, by Mr. Nepean (who ſails in a few days), of thanking you for the ſame, and of anſwering to ſome few particulars, ſo far as am able; but I ſhall hereafter write you more fully on the ſame ſubject.

It gives me ſenſible pleaſure, to find the opinion of the Society, reſpecting our Cinnamon, confirmed by Commercial Gentlemen engaged in that branch of trade:* this will have more influence on the minds of people in this Colony, in exerting their attention to ſo important an object, than the deciſion of men of ſcience, to which they pay little deference.

Notwithſtanding the careful and repeated inveſtigation the Cinnamon of this Iſland has undergone, ſome perſons aſſert, that it is not the true Ceylon Cinnamon, but the Caſſia. I think it unneceſſary to anſwer

* See Volume X. p. 256.

anſwer them, becauſe I am fully ſatisfied that, unleſs every account given of the different ſpecies, or varieties, is erroneous, ours is the real *Raſſe Coronde*, or beſt ſort. This I am more confirmed in, by the extract the Committee of the Society has been pleaſed to favour me with: and though ſoil and climate may occaſion ſome ſlight difference in the colour and grain of the bark, the aroma is exactly the ſame, and of equal, if not ſuperior, ſtrength; ſo that I have no doubt of its meeting with a market, when we are able to ſend it. While meaſures are taken on every ſide to injure the ſtaple trade of this iſland, we muſt think ourſelves highly indebted to the Society, for recommending and encouraging, by premiums, the cultivation and introduction of ſuch articles as may open a new ſource of trade and wealth.

After deſpairing for a long time, a few plants of the Ché, or Oldenlandia Umbellata, (See Vol. X. p. 259) made their appearance

pearance, and I have had a ſecond crop. I ſhall encloſe you a ſmall packet of ſeed.

I obſerve what you ſay about preparing alkaline ſalts from our marine plants; I have already made ſome trials with the *Betis Maritima*, employed by the Spaniards at Carthagena for that purpoſe; but I have not had ſufficient leiſure to proſecute the buſineſs. I hope, in my next, to give you more ſatisfactory intelligence on this and ſome other matters.

I have, for ſome time paſt, had the Acaſia (or Mimoſa)*, of which you ſent me ſeeds, growing in the Botanic Garden. It was obtained from Sir Joſeph Banks, about four years ago, and has many of the characters of the *nilotica*, or gum arabic tree, but has never produced any gum; whilſt another tree, which is very defective in its character, has produced very fine gum.

I am

* Brought from Egypt by Mr. Boylſton.

I am printing (for the firſt time), by order of the Houſe of Aſſembly, a catalogue of our garden, a copy of which, when publiſhed, I ſhall ſend to you, and beg leave to ſolicit the continuance of your contributions.

I have of late been occupied in collecting plants for his Majeſty's Garden at Kew, for Sir Joſeph Banks, and ſome other Gentlemen, which has diverted my attention from other purſuits; but that buſineſs being completed, I ſhall have in view the conſideration of what you recommend.

I remain very reſpectfully,

SIR,

Your obedient humble ſervant,

THOMAS DANCER.

Mr. MORE.

SIR,

SIR,

I WROTE to you ſome time ago to acknowledge the receipt of your favour. The Ché, or Oldenlandia Umbellata, with which you obliged me, ſucceeds wonderfully well, and I have ſent a ſmall parcel of the root for trial. I have not Dr. Anderſon's proceſs by me; but I find that, in decoction with an alkali, it yields a deep red colour.

The *Baſilla Rubra* likewiſe, another Eaſt-India dye, flouriſhes; but I am not yet acquainted with the mode of fixing the beautiful colour it gives. In the courſe of my different journeys, whilſt collecting plants for Kew Garden, I collected a great many Lichens; but, on trial, I found none of them to be compared with the Lichen

Lichen Rocella, from the Canary Iſlands, which you ſent me.

The *Betis Maritima*, which grows in the greateſt abundance in all the ſalinas of this Iſland, has been long employed by the Spaniards, in South America, in the making of glaſs, (Vide Jacquin, Stirpes Americanæ.) I will endeavour to ſend you home ſome ſpecimens of Kelp, prepared from this and ſome other marine plants. I now come to ſay a word or two more on the ſubject of Cinnamon. The Jamaica Cinnamon exceeds, in the opinion of every one, the ſpecimens of Ceylon Cinnamon, ſent me by Mr. Travers; but many perſons think thoſe ſpecimens very bad. I am happy, however, to inform you, that the attention paid by the Society to this intereſting ſubject, has had the deſired effect, of awakening the public of this Iſland to a ſenſe of its importance. It is probable that a bill will be brought in, during the next Seſſion of

Aſſembly, to encourage, by offer of liberal premiums, the cultivation of this and the other ſpices; but the intention of the Legiſlative Gentlemen is already, in ſome degree, anticipated; for ſeveral Gentlemen are going largely into the planting of Cinnamon: I have it on good authority, that one Gentleman has already ſet out fifty thouſand trees.

I have lately, by order of the Houſe of Aſſembly, publiſhed the catalogue of our garden, a copy of which I beg very reſpectfully to preſent to the Society, and ſend another copy for your own acceptance. Knowing our ſtock, you will be at no loſs to underſtand what will be acceptable; and I ſhall always be grateful for any contributions you can procure for this infant eſtabliſhment, which I have found ſo much difficulty in ſupporting.

The

The Ché roots, with the catalogues, you will receive by the ſhip Beckford, Captain Ayton, addreſſed to the care of Mr. Vaughan.

I remain, SIR,

With ſentiments of eſteem,

Your very humble ſervant,

THOMAS DANCER.

Botanic Garden, Jamaica, July 24, 1792.

Mr. MORE.

The SILVER MEDAL was this year voted to Mrs. ANSTEY, from whom the following letters were received, and to whom the introduction of the Cinnamon-Tree, into the Britiſh Settlement at Madras, was owing. For, in the former war with Hyder Ally, when Mrs. ANSTEY (whoſe name at that time was *Light)* took refuge in the Iſland of Ceylon, ſhe obtained from the Dutch two young Cinnamon Trees, which, on her return to Madras, ſhe conveyed thither, and from which all the trees of that kind, at and in the neighbourhood of that Settlement, have been produced.

SIR,

I LITTLE thought to have been the firſt to have conveyed you thoſe ſamples of Cinnamon you required, which I had

I had written for from England; and my directions, as you will ſee, have been punctually obſerved. The accompanying ſpecimens, my friend, Mr. Torin, has lately ſent to me, at this place, in order that they might be forwarded to me in England, without an idea of my being on the ſpot to receive them.*

I had the ſatisfaction of hearing, immediately on my arrival at Madras, the very ſucceſsful progreſs of my Cinnamon Plantation, which Mr. Torin's and Mr. Marten's letters will more fully aſcertain, as will alſo Dr. Anderſon's publication, which I likewiſe encloſe to you, not only on account of my name being mentioned, but alſo to ſhew you there are people in the Eaſt, who are eager to promote, in different forms, what might enrich our Eaſtern poſſeſſions in particular, and Society in general; and who neither ſpare expence or labour of body or mind, for the encouragement of Arts.

* Theſe ſpecimens are reſerved in the Society's collection.

Beſides the ſpecimens I have lately received from the Southward, I ſend you ſeveral little branches of a tree, growing in Dr. Anderſon's garden, under the care of Dr. Berry, at Marmalong, about ſeven miles from Fort St. George, which I have viſited, and found in a very flouriſhing ſtate, about four years old, grown from ſeed of the parent tree I brought myſelf from Columbo, and has been upwards of two years at Madras. The bark, when I taſted it a few days ago, had a very ſtrong and fine flavour; it has not yet bloſſomed, nor is it at preſent in a ſtate to yield any bark as ſamples.

I had a very fortunate paſſage, being only three months and ten days, from the time of our loſing ſight of Old England, which was on the 6th of May: I embarked the 1ſt, at eleven at night, and was in the Roads of Madras the 15th of Auguſt, at noon.

You

You will find, by the enclosed letters, there is little doubt but that our Settlement on the Coromandel Coast will prove as great a mart to the English Company, for the Cinnamon Trade, in a few years, as ever Ceylon has proved to the Dutch.

I am, SIR,

Your much obliged,

And obedient servant,

L. ANSTEY.

Madras,
Sept. 17, 1791.

Mr. MORE.

Copy of part of a Letter from Mr. TORIN *to Mrs.* ANSTEY, *dated* Tinnevelly, July 10, 1791.

DEAR MADAM,

MR. Kindersley has lately sent me your letter, relative to the specimens and other testimony you wish to

procure of the Cinnamon; and I readily undertake to furniſh you with the proofs you require, happy in this proper occaſion to ſhew my ſenſe of the many civilities I experienced from your family at Palamcotah.

As I am no longer paymaſter, or in charge of the garden, I am obliged to proceed, with the aſſiſtance of Mr. Marten, who has promiſed to ſupport your claims on the public, upon this ſcore, with all the information you require, and the ſubject will admit; and the great care he takes of the plantation, leaves us little doubt but you will derive every advantage from its proſperity.

As ſoon as I heard of the views you entertained from its public utility, I cauſed ſome plants to be moved to a more favourable ſoil, under the hills, and near to the water-fall at Tankanſhy; recommending at the ſame time to Government, to order a piece

piece of ground to be encloſed, and appropriated to the purpoſe, by a grant from the Nabob.

All the queſtions you have put, and the ſpecimens you require, will be anſwered and prepared in time for the ſhips before October, except that of the bloſſom, which we muſt ſend you next ſeaſon. In the year 1790, I reared upwards of two thouſand plants; and, as they have ſurvived a twelvemonth, and are moſtly of the firſt ſort, there is little doubt of their ſucceeding.

DEAR MADAM,

PREVIOUS to the receipt of your favour of the 30th of March, I had the honour to addreſs you relative to the Cinnamon; and, in conſequence of a letter from Mr. Kinderſley, I have now the pleaſure to ſend you ſpecimens of the trees, of which the Paymaſter has at leaſt five thouſand

ſand young plants in his garden: theſe are ſent to you, to guard againſt accident that may happen to thoſe publicly tranſmitted to the Court of Directors.

We have not yet acquired the art of taking off the bark, and ſeparating it from the outer rind. In a few weeks we hope to accompliſh this; and you ſhall then receive further ſamples of it. There can be no manner of doubt, I think, of the increaſing proſperity of the plantation, now the Government have given it their countenance.

I lately viſited my plantation under the hills, and found it thriving ſurpriſingly well. You need be under no apprehenſion whatever with reſpect to the quality of the parent tree, as I have received the opinion even of ſome Dutch gentlemen upon it; nor do I apprehend that the plant will degenerate: they grow from ſeed, and from layers, and only require the ſhade of other trees for the firſt twelvemonth. The few experiments from cuttings did not ſucceed; but we will try again.

I muſt

I muſt not forget to remark, that theſe ſamples are ſeen under a great diſadvantage, as we have learnt that the fineſt Cinnamon is produced from the young ſcions which ſhoot up from the root after the tree has been cut down: this is a part of the proceſs we have not yet arrived at; but it will be attempted this ſeaſon.

Mr. Marten beſtows every poſſible care on the culture, and will think his labours very well rewarded, if it ſhould prove beneficial to you; to whom, we all allow, the Company and the Public will be ſolely indebted for whatever advantages may reſult from the plantations.

I remain, DEAR MADAM,

Your very obedient ſervant,

B. TORIN.

Tinnevelly,
Aug. 24, 1791.

Mrs. ANSTEY.

SIR,

SIR,

I HAVE to acknowledge the receipt of the ſeveral orders of Government through you.

I have the pleaſure to acquaint Government, that the ground allotted as a Cinnamon plantation is already encloſed, and the fields are now preparing for the reception of the plants, which I ſhall not attempt to move until the land-winds are over, and the cool ſeaſon commenced. Of the ſeed which I have ſown ſince my laſt addreſs upon this ſubject, of the firſt ſort (for I have reaſon to think it the ſuperior ſpecies of Cinnamon found on Ceylon), to the number of four thouſand, ſeveral have made their appearance: thoſe of the ſecond ſort, which I have put into the ground, are innumerable; and I do not think myſelf too

too ſanguine in the expectation of ſtocking the plantation this year.

I have attempted, in compliance with Government's directions, to take off, and prepare, the Cinnamon ſamples, which I now ſend; but, in juſtice to Mrs. Anſtey, who firſt brought this valuable ſpice into our poſſeſſions, I muſt remark, that theſe ſamples are ſubmitted to inſpection under every poſſible diſadvantage. In the firſt place, I am not thoroughly convinced that the modes I have adopted for ſeparating and drying the barks, are proper, though correct with every information I have been able to obtain. The former is performed (after expoſing the ſhoots about half an hour in the ſun, that the juice may be leſs liable to eſcape) by cutting two oppoſite longitudinal ſlips through the bark, and ſtriking them with a round ſmooth ſtick, which immediately ſeparates the Cinnamon from the wood. Secondly, I underſtand the Dutch cut down their trees when three years

years old; and that their beſt Cinnamon is taken from the ſhoots ſtriking from the remaining ſtump, at the time when they are moſt luxuriant in ſap. This experiment I intend trying in October upon ſome trees of the ſecond ſort, which are of the proper age. I have none of a ſuperior quality above twelve months growth; but Government muſt be convinced of the diſadvantage under which theſe ſamples appear, when they are informed, that they are taken from old trees, in their original ſtate, at this (the dryeſt) ſeaſon of the year, and when their juices are expended in their fruit.

Dr. Anderſon, I underſtand, wiſhes me to ſuperintend the mulberry cultivation in theſe diſtricts—an experiment that I will readily undertake; and, as it will be neceſſary to have ſome ſhelter for the young Cinnamon plants, I purpoſe interſecting each row of Cinnamon with a hedge of mulberry, which will anſwer equally well as any other ſhade, and will be trying two experiments under

under one expence. The mulberry is not uncommon to this country.

I am, SIR,

Your moſt obedient ſervant,

J. MARTEN.

Palamcotah,
July 10, 1791.

W. COLLINS JACKSON,
Eſq. Secretary to the
Military and Secret
Department, Fort St.
George, Madras.

REWARDS

BESTOWED BY THE

SOCIETY,

From OCTOBER, 1792,

To JUNE, 1793.

REWARDS

BESTOWED IN

AGRICULTURE.

TO THOMAS SKIP DYOT BUCKNALL, Esq. for his mode of pruning Orchards, the SILVER MEDAL. See page 7.

Class 82. To Mr. ARTHUR TABRUM, for his account of cultivating eight acres of land, to determine the comparative advantages of the drill and broadcast method, in the culture of Wheat, the SILVER MEDAL and TWENTY GUINEAS. See page 32.

To MONTAGUE BURGOYNE, Esq. for his account of experiments on the drill and broad-

caſt culture of Wheat, the SILVER MEDAL. See page 43.

To EDWARD TRELAWNEY, Eſq. for his account of experiments on the drill and broad-caſt culture of Wheat, the SILVER MEDAL. See page 50.

To JAMES RODNEY, Eſq. for his account of experiments on the drill and broad-caſt culture of Wheat, the SILVER MEDAL. See page 62.

Claſs 88. To Mr. PETER SMITH, for his account of experiments, to determine the comparative advantages of the drill and broad-caſt method in the cultivation of Turneps, the SILVER MEDAL and TEN GUINEAS. See page 105.

Claſs

Claſs 99. To Mr. WILLIAM HOLLINS, for his account of the cauſe and cure of the Curl in Potatoes, TEN GUINEAS, part of the premium. See page 75.

Claſs 100. To WILLIAM BARBOR, Eſq. for his account of the uſe of Potatoes in feeding Cattle and Sheep, the GOLD MEDAL. See page 88.

To Mr. JAMES BUCKNELL, for his account of the uſe of Potatoes in feeding Cattle and Sheep, the SILVER MEDAL. See page 98.

Claſs 105. To Mr. PETER SMITH, for his account of the advantage of ſtall-feeding Horſes, the SILVER MEDAL and TEN GUINEAS. See page 69.

Claſs 108. To Mr. THOMAS JONES, for having raiſed, in the year

1792, three hundred plants of the Rheum Palmatum, or true Rhubarb, the GOLD MEDAL. See page 113.

Claſs 112. To Mr. THOMAS HALLEY, for his account of a method of curing Rhubarb, the SILVER MEDAL. See page 126.

Claſs 132. To CHARLES HASSALL, Eſq. for his account of improving Waſte Moor Land, the GOLD MEDAL. See page 134.

Claſs 141. To Mr. JAMES M'DOUGALE, for his improved Hoe, TWENTY GUINEAS. See page 139.

IN POLITE AND LIBERAL ARTS.

Claſs 180. To Lady CHARLOTTE LEGGE, for a Drawing, the SILVER MEDAL. Subject, the Woodman, after Barker.

Claſs

Claſs 182. To Mr. THOMAS PRESTON, for a Drawing, the SILVER MEDAL. Subject, Shepherd's Boy, after Gainſborough.

Claſs 183. To Miſs MARIA CHARLOTTE WILSON, for a Drawing, the GOLD MEDAL. Subject, Landſcape, — Original Compoſition.

Claſs 184. To Miſs ELIZABETH CHRISTIANA FANSHAWE, for a Drawing, the SILVER MEDAL. Subject, a Landſcape—View in Ireland.

Claſs 189. To Mr. W. MONTAGUE, CLARK, for a Drawing of a Machine, the GREATER SILVER PALLET. Subject, an Inclined Plane for the uſe of Canal Navigation.

Claſs 190. To Mr. W. TURNER, for a Drawing of a Landſcape, after Nature, the GREATER SILVER PALLET. Subject, Lodge Farm, near Hambleton, Surrey.

Claſs 191. To Mr. J. S. AGAR, for an Hiſtorical Drawing, the GREATER SILVER PALLET. Subject, the Judgment of Solomon.

To Mr. ROBERT KER PORTER, for an Hiſtorical Drawing, the LESSER SILVER PALLET. Subject, the Witch of Endor.

To Mrs. M. M. BERENS, for Drawings, the GREATER SILVER PALLET. Subject, Fruit, Flowers, and Birds.

Claſs

Claſs 195. To Mr. WILLIAM FADEN, for his Survey of Hampſhire, FIFTY POUNDS.

IN MANUFACTURES.

To Mr. ROBERT BURT, for his Spinning and Winding Machine, FIFTEEN GUINEAS. See page 147.

To Mr. JOHN ANTIS, for his improvement of the common Spinning-Wheel, TWENTY GUINEAS. See page 152.

IN MECHANICKS.

To Mr. STEPHEN KENDRICK, for his improved Gudgeon, the SILVER MEDAL. See page 161.

To

To GEORGE QUAYLE, Eſq. for his mode of equalizing Water on Water-wheels. See page 163.

To Mr. RICHARD JOHNSON, for his Double Gib Crane, for raiſing and depoſiting great Weights, TWENTY GUINEAS. See page 170.

To Mr. JOHN BELL, for his improved method of taking Whales by the Gun Harpoon, TWENTY GUINEAS. See page 185.

To Mr. THOMAS COLLEY, for his method of locking Carts, to prevent accidents in deſcending ſteep hills, the SILVER MEDAL. See page 193.

To

To Mr. JOSEPH DIXON, for his method of preventing accidents in Walking Wheel Cranes, FIFTEEN GUINEAS. See page 199.

IN COLONIES AND TRADE.

To Mrs. ANSTEY, for having introduced the Cinnamon Tree into the Britiſh Settlement at Madras, the SILVER MEDAL. See page 212.

PRESENTS

RECEIVED BY THE

SOCIETY,

Since the Publication of the TENTH VOLUME of these TRANSACTIONS.

With the Names of the DONORS.

BOOKS.

DUBLIN SOCIETY.

PREMIUMS offered by the Dublin Society, for the year 1792.

BATH SOCIETY.

Letters and Papers on Agriculture, Planting, &c. addreſſed to the Society inſtituted at Bath, for the Encouragement of Agriculture, &c. Vol. VI.

HARWARD

HAVARD UNIVERSITY, New England.

Catalogus Bibliothecæ Havardianæ Nov. Anglorum, octavo.

The MEDICAL SOCIETY at London.

The 3d volume of Memoirs of the Medical Society at London, octavo.

VALENTINE GREEN, Eſq.

Acta Hiſtorica Reginarum Angliæ, quarto.

Mr. GEORGE SAUNDERS.

A Treatiſe on Theatres, with plates, quarto, by Mr. G. Saunders.

Dr. DANCER, of Jamaica.

A Catalogue of Plants, in the Botanic Garden in Jamaica; and a brief Hiſtory of the late Expedition againſt Fort San Juan.

The

The ROYAL SOCIETY.

The 2d Part of the 82d Volume of the Philoſophical Tranſactions of the Royal Society.

COUNT BERCHTOLD.

Enſaio de vario Meios com que ſe intanta ſalvar, e conſervara vida dos Homens em diverſos perigos, a que diariamente ſe acháo expoſtas.

SIR JOHN SINCLAIR, Bart.

The Statiſtical Account of Scotland, drawn up from communications from the Miniſters of the different Pariſhes, 4 volumes, octavo.

And a pamphlet entitled, Obſervations on the different Breeds of Sheep, &c.

The Rev. THOMAS MARTYN.

Flora Ruſtica, octavo, by the Rev. Thomas Martyn.

The

The Society for Improvement of Naval Architecture.

A Liſt of Premiums offered by the Society for Improvement of Naval Architecture.

Monsieur Mechel.

Deſcription & Repréſentation d'une Nouvelle Preſſe d'Imprimerie, par Guillaume Haas père.

Dr. Lettsom.

An Eſſay on the Diſeaſes produced by the Bite of a Mad Dog, or other Rabid Animals, by James Meaſe, M. D. With a Preface and Appendix, by J. Coakley Lettſom, M. D. octavo.

James Barry, Eſq. R. A.

A pamphlet entitled, A Letter to the Preſident, &c. of the Society.

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PRINTS.

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Twelve proof impreſſions, being a complete ſet of the Hiſtorical Mezzotinto Engravings, formed on the Hiſtory of the Queens of England.

JAMES BARRY, Eſq. R. A.

A Print, ſhewing a propoſed alteration in the picture, in the Society's Great Room, entitled Elyſium, or the State of Final Retribution.

MISCELLANEOUS.

LEWIS MAJENDIE, Eſq.

A bag of Meadow Feſcue Graſs Seed.

Captain EDWARD PAKENHAM.

A model of a Rudder, with an apparatus to prevent its being loſt. See page 176.

RALPH

RALPH WARD, Eſq.

A marble Statue of the late Mr. Joſhua Ward.

Captain THOMAS HAMILTON.

A Turn-riſe Plough.

WILLIAM NOBLE, Eſq.

A ſample of Cinnamon, from Windſor Eſtate, in the Iſland of Jamaica.

Mrs. ANSTEY.

Some Bark of the Cinnamon-Tree, growing at Madras, with ſpecimens of the leaves.

A CATALOGUE

OF THE

MODELS AND MACHINES,

Received ſince the Publication of the Tenth Volume of the Society's Tranſactions, with the Numbers, as they are arranged in the Claſs to which they belong.

AGRICULTURE. CLASS I.

No. LXXIX. AN improved Hoe, by Mr. James M'Dougale, for which he had a premium of Twenty Guineas.

MANUFACTURES.

MANUFACTURES. Clafs III.

XXVIII. A Spinning and Winding Machine, by Mr. Robert Burt, for which he had a bounty of Fifteen Guineas.

XXIX. An improved common Spinning-wheel, by Mr. John Antis, for which he had a bounty of Twenty Guineas.

MECHANICKS. Clafs IV.

CXL. An improved Gudgeon, by Mr. Stephen Kendrick, for which the Silver Medal was preſented to him.

CXLI. A model of an improved method of locking Carts, by Mr. Thomas Colley, for which the Silver Medal was preſented to him.

Claſs IV.

CXLII. A model, ſhewing a mode of equalizing Water on Water-wheels, by George Quayle, Eſq. for which the Silver Medal was preſented to him.

CXLIII. A model of a Double Gib Crane, by Mr. Richard Johnſon, for which he had a bounty of Twenty Guineas.

CXLIV. A model of an improved Walking-Wheel Crane, by Mr. Joſeph Dixon, for which he had a bounty of Fifteen Guineas.

CXLV. A model of an improved Gun and Harpoon for killing Whales, by Mr. John Bell, Serjeant of Artillery, for which he had a bounty of Twenty Guineas.

A LIST

A LIST

OF THE

OFFICERS of the SOCIETY,

AND

CHAIRMEN

OF THE SEVERAL

COMMITTEES,

Elected March 22, 1793.

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Mr. G. Wilſon.

COLONIES AND TRADE.

Mr. Joſeph Pourcin.
John Baker, Eſq.

MISCELLANEOUS MATTERS.

Mr. Jacob.
Mr. A. Hall.

PREMIUMS

OFFERED BY THE

SOCIETY

FOR THE ENCOURAGEMENT OF

ARTS, MANUFACTURES,

AND

COMMERCE,

IN

THE YEAR M.DCC.XCIII.

TO THE

PUBLIC.

ADELPHI-BUILDINGS,
April 10, 1793.

THE chief objects of the attention of the Society for the Encouragement of Arts, Manufactures, and Commerce, in the application of their Rewards, are Ingenuity in the ſeveral branches of the POLITE and LIBERAL ARTS, uſeful Diſcoveries and Improvements in AGRICULTURE, MANUFACTURES, MECHANICKS, and CHEMISTRY, or the laying open any ſuch to the Public; and, in general, all ſuch uſeful Inventions, Diſcoveries, or Improvements (though not mentioned in the Book of Premiums), as may appear to have a tendency to the advantage of Trade and Commerce. The Society therefore, in purſuance of their plan, propoſe to beſtow the following Premiums.

Premiums

Premiums for Planting and Huſbandry.

Claſs 1. ACORNS. For having ſet, between the firſt of October, 1792, and the firſt of April, 1793, the greateſt quantity of ſtrong land, not leſs than ten acres, with Acorns, and ſeeds or cuttings of other trees, and for the effectually fencing and preſerving the ſame, in order to raiſe timber and underwood, the GOLD MEDAL.

2. For the ſecond greateſt quantity of land, not leſs than five acres, ſown or ſet agreeably to the above conditions, the SILVER MEDAL.

CERTIFICATES of ſetting or ſowing, agreeably to the above conditions, and that there are not fewer than three hundred young Oaks on each acre, to be delivered to the Society on or before the firſt Tueſday in November, 1793.

3, 4. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1794.

5, 6.

5, 6. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or befor the firſt Tueſday in November, 1795.

7, 8. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1796.

9. RAISING OAKS. To the perſon who ſhall have raiſed, ſince the year 1790, the greateſt number of Oaks, not fewer than five thouſand, either from young plants, or from acorns, in woods, parks, or foreſts, that have long been under timber, and effectually fenced and preſerved the ſame, in order to ſecure a ſucceſſion of oak timber in this kingdom; the GOLD MEDAL.

10. For the next greateſt quantity, not fewer than three thouſand, the SILVER MEDAL.

CERTIFICATES that there were on the land, upon the firſt of November, 1793, at leaſt

leaſt the number of young Oak-trees required, in a thriving condition, effectually fenced and preſerved, with an account of the methods purſued in making and managing the plantation, to be produced to the Society on or before the firſt Tueſday in January, 1794.

11, 12. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1795.

13, 14. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1796.

15. ASCERTAINING THE BEST METHOD OF RAISING OAKS. To the perſon who ſhall aſcertain in the beſt manner, by actual experiments, the comparative merits of the different modes of raiſing Oaks for timber, either by acorns ſet on land properly grubbed aud tilled; from acorns ſown at random among buſhes, fern,

or

or other cover; or by young plants, previouſly raiſed in nurſeries, and tranſplanted; regard being had to the expence, growth, and other reſpective advantages of the ſeveral methods; the GOLD MEDAL.

The ACCOUNTS and proper CERTIFICATES to be produced to the Society on or before the firſt Tueſday in November, 1793.

16. The ſame premium is extended one year further. The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in November, 1794.

17. CHESNUTS. For having ſown or ſet, between the firſt of October, 1792, and the firſt of April, 1793, the greateſt quantity of dry loamy land, not leſs than ſix acres, with a mixture of Spaniſh Cheſnuts, and the ſeeds or cuttings of other trees adapted to ſuch ſoil; and for effectually fencing and preſerving the ſame, in order to raiſe timber; the GOLD MEDAL.

18. For the ſecond greateſt quantity, not leſs than four acres, the SILVER MEDAL.

CERTIFICATES of ſowing or ſetting agreeably to the above conditions, and that there are not fewer than three hundred Cheſnut plants, in a thriving ſtate, on each acre, to be delivered to the Society on or before the firſt Tueſday in November, 1793.

19, 20. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1794.

21, 22. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1795.

23, 24. The ſame premiums are extended one year further.

CERTI-

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1796.

25. ELM. For having planted the greateſt number of the Engliſh Elm, not leſs than eight thouſand, between the twenty-fourth of June, 1792, and the twenty-fourth of June, 1793; and for the having effectually fenced and preſerved the ſame, in order to raiſe timber; the GOLD MEDAL.

26. For the ſecond greateſt number, not leſs than five thouſand, the SILVER MEDAL.

27. For the third greateſt number, not leſs than four thouſand, the SILVER MEDAL.

CERTIFICATES of the having planted agreeably to the above conditions, that the plants were in a healthy and thriving ſtate two years at leaſt after making the plantation, and ſpecifying the diſtance of the plants, to be delivered to the Society on

or before the firſt Tueſday in November, 1793.

28, 29, 30. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1794.

31, 32, 33. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1795.

34, 35, 36. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1796.

37. LARCH. For having planted out, between the twenty-fourth of June, 1790, and the twenty-fourth of June, 1791, the greateſt number of Larch-trees, not fewer than five thouſand; and for having effectually fenced and preſerved the ſame, in order to raiſe timber; the GOLD MEDAL.

38.

38. For the next greateſt number, not fewer than three thouſand, the SILVER MEDAL.

CERTIFICATES of the number of plants, that they were in a healthy and thriving ſtate two years at leaſt after they were planted out, with a general account of the methods uſed in making the plantation, to be delivered to the Society on or before the laſt Tueſday in December, 1793.

39, 40. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1794.

41, 42. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1795.

43, 44. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1796.

45, 46. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1797.

47, 48. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1798.

N. B. The Larch-trees may be either planted, mixed with other trees, or by themſelves, as may beſt ſuit the convenience of the planter.

49. SILVER FIR. For having planted out, between the twenty-fourth of June, 1789, and the twenty-fourth of June, 1790, in a mixed plantation of foreſt-trees, the greateſt number of Silver Firs, not fewer than two thouſand; and for having effectually fenced and preſerved the ſame, in order to raiſe timber; the GOLD MEDAL.

50.

50. For the next greateſt number, not fewer than one thouſand, the SILVER MEDAL.

CERTIFICATES of the number of plants, that they were in a healthy and thriving ſtate two years at leaſt after they were planted out, with a general account of the methods uſed in making the plantation, to be delivered to the Society on or before the laſt Tueſday in December, 1793.

51, 52. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1794.

52, 53. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1795.

54, 55. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1796.

56. UPLAND OR RED WILLOW. For the greateſt number of acres, not leſs than three, planted before the end of April, 1792, with Upland or Red Willow, properly fenced and ſecured; the number of plants on each acre to be at leaſt twelve hundred; the GOLD MEDAL, or TWENTY POUNDS.

CERTIFICATES of the number of plants, and that they were in a thriving ſtate at the time of ſigning ſuch Certificates, to be produced to the Society on or before the laſt Tueſday in November, 1794.

It is well known that this ſpecies of Willow thrives well on dry ſandy land.

57. OSIERS. To the perſon who ſhall have planted, before the twelfth of April, 1793, the greateſt quantity of land, not leſs than three acres, with thoſe kinds of Willows,

Willows, commonly known by the names of Oſier, Spaniard, or new kind, fit for the purpoſe of baſket-makers, nt few: than twelve thouſand plants on each acre; TWENTY POUNDS.

58. For the ſecond greateſt quantity of land, not leſs than two acres, TEN POUNDS.

CERTIFICATES of the planting, and that the plants are in a thriving ſtate at the time of ſigning the Certificate, to be produced on or before the laſt Tueſday in November, 1793.

59, 60. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in November, 1794.

61. ALDER. For having planted, in the year 1790, the greateſt number of Alders, not leſs than three thouſand, on an eſtate the property of one perſon; the GOLD MEDAL.

CERTI-

CERTIFICATES of the number of plants, and that they were in a thriving ſtate two years at leaſt after being planted, to be delivered to the Society on or before the laſt Tueſday in December, 1793.

62. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1794.

63. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1795.

64. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1796.

65. ASH. For having ſown or ſet, in the year 1790, the greateſt quantity of land, not

not leſs than ſix acres, with Aſh for timber, intermixed with ſeeds, cuttings, or plants of ſuch other trees as are adapted to the ſoil; the GOLD MEDAL.

66. For the next greateſt quantity, not leſs than four acres, the SILVER MEDAL.

CERTIFICATES of the ſowing or ſetting agreeably to the above conditions, that there are not fewer than one hundred Aſh plants on each acre, in a thriving and healthy condition, two years at leaſt after the ſowing or ſetting, with a general account of the methods uſed in making the plantation, to be delivered to the Society on or before the laſt Tueſday in December, 1793.

67, 68. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1794.

69,

69, 70. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1795.

71, 72. The ſame premiums are extended one year furrher.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1796.

73, 74. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1797.

75. MIXED TIMBER-TREES. To the perſon who ſhall have incloſed, planted, or ſown, the greateſt number of acres, not leſs than ten, with the beſt ſorts of Foreſt-trees, for timber, between the firſt of October, 1789, and the firſt of May, 1791; the GOLD MEDAL.

An

An account of the methods uſed in making the plantations, and of the nature of the ſoil, together with proper Certificates that the trees were in a thriving and healthy ſtate two years at leaſt after making the plantation, to be delivered to the Society on or before the firſt Tueſday in November, 1793.

76. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in November, 1794.

77. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in November, 1795.

78. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in November, 1796.

N. B.

N. B. With the above foreſt-trees, the ſeeds, cuttings, or plants, of ſuch other trees as are adapted to the ſoil, and proper for underwood, may be intermixed.

79. SECURING PLANTATIONS OF TIMBER-TREES. To the perſon who ſhall give to the Society the moſt ſatisfactory Account, founded on experience, of the moſt effectual and leaſt expenſive method of ſecuring young plantations of Timber-Trees, from Hares and Rabbits, as well as Sheep and larger cattle, which at the ſame time ſhall be leaſt ſubject to the depredations of wood-ſtealers, the SILVER MEDAL or TWENTY POUNDS.

The ACCOUNTS and CERTIFICATES of the efficacy of the method, to be produced to the Society on or before the firſt Tueſday in November, 1793.

80. The ſame premium is extended one year further.

The

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in November, 1794.

81. MULBERRY CUTTINGS, OR TREES. For having planted the greateſt number of White or Black Mulberry Cuttings or Trees, not fewer than three hundred, in the year 1791, for the purpoſe of feeding Silk-worms; the GOLD MEDAL, or TWENTY POUNDS.

82. For the ſecond greateſt quantity, not fewer than one hundred and fifty, the SILVER MEDAL, or TEN POUNDS.

CERTIFICATES of ſuch planting, with the manner of culture, and that the trees were growing in the month of July, 1793, to be produced to the Society on or before the firſt Tueſday in November, 1793.

*** *The Candidates for planting all kinds of Trees are to certify, that the reſpective Plantations*

Plantations are properly fenced and ſecured, and particularly to ſtate the Condition the Plants were in at the time of ſigning ſuch Certificates.

Any information which the Candidates for the foregoing Premiums may chooſe to communicate, relative to the methods made uſe of in forming the Plantation, or promoting the growth of the ſeveral Trees, or any other obſervations that may have occurred on the ſubject, will be thankfully received.

83. TREES FOR USE WHEN EXPOSED TO THE WEATHER. To the perſon who ſhall ſend the moſt ſatisfactory account and certificate, verified by experiments, to determine which of the following trees is of the greateſt utility for timber or poles, for uſe, when expoſed to the weather, viz.

Larch,	Spaniſh Cheſnut,
Black Poplar,	Willow,
Aſh,	Alder,
	Beech,

Beech, Lombardy Poplar;
Silver Fir,

the GOLD MEDAL.

The ACCOUNTS and CERTIFICATES to be produced on or before the ſecond Tueſday in December, 1793.

84. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the ſecond Tueſday in December, 1794.

85. PLANTING BOGGY OR MORASSY SOILS. For an account of the beſt ſet of experiments ſent by the planter, or his repreſentative, to aſcertain the comparative advantages of planting boggy or moraſſy ſoils with White Poplar, Black Poplar, Lombardy Poplar, and Willow, the GOLD MEDAL, or TWENTY GUINEAS.

It is required that not leſs than half an acre be planted with each, and the plants to be not more than four feet aſunder.

It

It is alſo required that the plantation ſtand fourteen years, at the end of which to be all cut down and meaſured, or accurately meaſured ſtanding; the Certificates of the meaſure and value, and that the whole is properly fenced and ſecured, to be produced on or before the firſt Tueſday in January, 1794.

N. B. Any information relating to the ſtate of the plantation, if ſent to the Society between the time of planting, and claiming the premium, will be thankfully received.

86. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1795.

87. The ſame premium is extended to the year 1796.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1797.

88. COMPARATIVE CULTURE OF WHEAT. For the beſt ſet of experiments

riments made on not leſs than eight acres, four of which to be ſown broad-caſt, and four drilled, to aſcertain whether it is moſt advantageous to cultivate wheat by ſowing it in the common broad-caſt way, or by drilling it in equidiſtant rows, hoeing the intervals; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS.

It is required that an account of the nature and condition of the land on which the experiments are made, together with an account of the produce of the Corn, be produced to the Society on or before the firſt Tueſday in February, 1794.

89. The ſame premium is extended one year further.

The ACCOUNTS to be produced to the Society on or before the firſt Tueſday in February, 1795.

90. COMPARATIVE CULTURE OF WHEAT. For the beſt ſet of experiments, made on not leſs than eight acres of land, four of which to be ſown broad-

caſt, and four dibbled, to aſcertain whether it is moſt advantageous to cultivate Wheat by ſowing it in the common broad-caſt way, or by dibbling it in equidiſtant rows, hoeing the intervals; the GOLD MEDAL, or the SILVER MEDAL and THIRTY GUINEAS.

It is required that an account of the nature and condition of the land on which the experiments are made, together with an account of the produce of the Corn, be produced to the Society on or before the firſt Tueſday in February, 1794.

91. BEANS AND WHEAT. To the perſon who ſhall have planted or drilled, between the firſt of September, 1791, and the firſt of March, 1792, the greateſt quantity of land, not leſs than ten acres, with Beans, and ſhall have ſown the ſame land with Wheat in the ſame year, 1792; TWENTY GUINEAS.

It is required that an account of the ſort and quantity of Beans, the time of planting or drilling, and of reaping or mowing them, the

the produce per acre threſhed, the application of the ſtraw, the expence of planting or drilling, hand or horſe hoeing, the diſtance of the rows, and the quality of the ſoil, together with CERTIFICATES of the number of acres, and that the land was actually ſown with Wheat in the year 1792, be produced on or before the firſt Tueſday in November, 1793.

N. B. The Society have been informed, that Beans may be drilled or planted ſo early as the month of December, from whence may be derived the advantage of an early harveſt; in which caſe the ſtraw will be far more valuable than that from a later planting or drilling.

92. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the firſt Tueſday in November, 1794.

93. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the firſt Tueſday in November, 1795.

94. DRILL HUSBANDRY. To the perſon who, in the year 1793, ſhall have cultivated the greateſt quantity of land, not leſs than four hundred acres, under the Drill ſyſtem, the wheat ſown in the autumn of the year 1792 included, the GOLD MEDAL.

An account of the quality of the ſoil, the various crops, and of the times of drilling and hoeing, with Certificates of the quantity of land, and the general appearance of the crop, to be delivered on or before the third Tueſday in February, 1794.

95. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered on or before the third Tueſday in February, 1795.

96.

96. TURNEPS. For the beſt account of experiments made on at leaſt ſix acres of land, to determine the comparative advantage of the drill or broad-caſt method in the cultivation of Turneps; the GOLD MEDAL, or the SILVER MEDAL and TEN GUINEAS.

The ACCOUNTS to be delivered in, on or before the third Tueſday in April, 1794.

It is required that one half of the land be drilled, and the other half ſown broad-caſt.

97. The ſame premium is extended one year further.

The ACCOUNTS to be delivered on or before the third Tueſday in April, 1795.

98. GREEN VEGETABLE FOOD. For the beſt account, confirmed by experiments, of the Vegetable Food (Cabbages and Turneps excepted), growing in the months of March and April, that will moſt increaſe the milk in Mares, Cows, and

Ewes, at that ſeaſon; provided ſuch food can be cultivated at an expence that will admit of its being applied to the above purpoſes; the GOLD MEDAL, or the SILVER MEDAL and TEN GUINEAS.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1793.

99. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1794.

100. COMPARATIVE CULTURE OF THE TURNEP-ROOTED CABBAGE. To the perſon who ſhall produce to the Society the beſt account of the moſt ſatisfactory experiments, made on at leaſt four acres of land, to aſcertain the comparative advantages of the culture of the Turnep-rooted Cabbage, by ſowing it broad-caſt, or in drills, and hoeing out the plants, as is practiſed with the common Turnep,

Turnep, or by ſowing the ſeed in nurſeries, and tranſplanting the plants at proper diſtances, hoeing the intervals; the SILVER MEDAL and TEN POUNDS.

It is required that at leaſt two acres be cultivated in each manner, and CERTIFICATES of the culture, with an account of the ſoil, expence, and produce of each ſeparately, be produced on or before the firſt Tueſday in October, 1793.

101. The ſame premium is extended one year further.

CERTIFICATES and ACCOUNTS to be produced on or before the firſt Tueſday in October, 1794.

102. TURNEP-ROOTED CABBAGE. For having raiſed, and duly cultivated, Turnep-rooted Cabbage, in the year 1792, for the feeding Cattle or Sheep, on the greateſt number of acres, not leſs than ten, and giving an account of the ſoil, culture, time, and manner of feeding off, produce, and the

effects on Cattle or Sheep fed with it; the GOLD MEDAL.

103. For the next greateſt number of acres, not leſs than five, the SILVER MEDAL and TEN GUINEAS.

CERTIFICATES of the quantity of land, with the accounts, to be produced on or before the laſt Tueſday in October, 1793.

104, 105. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in October, 1794.

106. POTATOES FOR FEEDING CATTLE AND SHEEP. To the perſon who, in the year 1792, ſhall have cultivated the greateſt quantity of land, not leſs than four acres, with Potatoes, for the ſole purpoſe of feeding Cattle and Sheep, the GOLD MEDAL, or TWENTY GUINEAS.

CERTIFICATES, with ſatisfactory Accounts of the expence and manner of cultivating the Potatoes, and the application of them

them to the above purpoſes, and the ſucceſs that has attended the uſe of them, to be delivered to the Society on or before the ſecond Tueſday in November, 1793.

107. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the ſecond Tueſday in November, 1794.

108. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the ſecond Tueſday in November, 1795.

N. B. Should any Gentleman have already cultivated Potatoes for the purpoſes mentioned in the above advertiſement, any information from him on the ſubject will be thankfully received by the Society.

109. CULTIVATING ROOTS AND HERBAGE FOR FEEDING SHEEP AND BLACK CATTLE. For the moſt ſatis-

ſatisfactory experiments made between Michaelmas, 1792, and the firſt of May, 1793, in order to aſcertain which of the following plants can be cultivated and houſed, or otherwiſe ſecured for winter fodder, to the greateſt advantage, viz.

Turnep-rooted Cabbage,	Carrots,
Turnep Cabbage,	Parſneps,
Turneps,	Potatoes;

the GOLD MEDAL.

The ACCOUNTS to be produced on or before the firſt Tueſday in November, 1793.

It is required that the above roots be taken off the land by the laſt day of October, 1792; that a crop of Wheat may be ſown in the ſame ground, and the particulars of the ſowing and planting, taking up, produce, preſerving, and application to the feeding Sheep and Black Cattle, be ſpecified. The comparative experiments muſt be made between two or more of any of the above-mentioned plants, and not leſs than one

one acre be cultivated with each particular kind of plant.

N. B. Great advantage will ariſe to the Farmer occupying land in the neighbourhood of extenſive commons, from the conveniency of keeping large flocks of Sheep, and herds of Cattle, if the difficulty of ſupporting them through the winter was obviated by a due knowledge of this practice.

110. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1794.

111. STALL-FEEDING HORSES WITH GREEN VEGETABLES. To the perſon who ſhall keep the greateſt number of Horſes, not fewer than four, in the Stall or Stable, during the greateſt number of months in the year, on Carrots, Potatoes, Lucern, Saintfoin, Clover, Vetches, or any other green vegetable food raiſed on land

land in his own poſſeſſion; the SILVER MEDAL and TEN GUINEAS.

It is required that the number of horſes ſo fed, the quantity of land employed in raiſing the green vegetable food, the quantity of hay and corn (if any) conſumed, the ſtate and condition of the horſes, an account of the work done by them, and of the quantity of dung obtained, as near as can be aſcertained, be fully and particularly ſpecified.

The ACCOUNTS and CERTIFICATES to be produced to the Society on or before the ſecond Tueſday in February, 1794.

112. MAKING HAY IN WET WEATHER. To the perſon who ſhall diſcover to the Society the beſt and cheapeſt method, ſuperior to any hitherto practiſed, of making Hay in wet weather, the GOLD MEDAL, or THIRTY GUINEAS.

A full Account of the method employed, and of the expence attending the proceſs, with not leſs than fifty-ſix pounds of the hay;

hay; and Certificates that at leaſt the produce of fifteen acres of land has been made according to the method deſcribed, and that the whole is of equal quality with the ſamples; to be produced to the Society on or before the firſt Tueſday in January, 1794.

113. The ſame premium is extended one year further.

The SAMPLES and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1795.

114. The ſame premium is extended one year further.

The SAMPLES and CERTIFICATES to be produced on before the firſt Tueſday in January, 1796.

115. CULTIVATING THE TRUE RHUBARB. For having raiſed, before the end of the year 1793, the greateſt number of plants, not leſs than three hundred, of Rheum Palmatum, or true Rhubarb, the GOLD MEDAL.

116.

116. For the next greateſt number, not leſs than two hundred plants, the SILVER MEDAL.

CERTIFICATES of the number of plants, that they ſtand at leaſt four feet aſunder, that they have been in a thriving ſtate during the preceding ſummer, with an account of the ſoil, culture, and aſpect, to be produced on or before the ſecond Tueſday in February, 1794.

117, 118. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in February, 1795.

119. RHUBARB. For the greateſt quantity of Rhubarb, of Britiſh growth, not leſs than twenty pounds weight, equal to ſuch as is commonly ſold in the ſhops under the name of Turkey or Ruſſia Rhubark; five pounds of which, as a ſample, with CERTIFICATES that the remainder is of equal goodneſs, and a particular Account

count of the manner of culture and cure, to be produced on or before the firſt Tueſday in November, 1793; the GOLD MEDAL.

120. For the next greateſt quantity, not leſs than ten pounds weight, the SILVER MEDAL.

121, 122. The ſame premiums are extended one year further.

The SAMPLES and CERTIFICATES to be produced on or before the firſt Tueſday in November, 1794.

123. ASCERTAINING THE COMPONENT PARTS OF ARABLE LAND. To the perſon who ſhall produce to the Society the moſt ſatisfactory ſet of experiments, to aſcertain the due proportion of the ſeveral component parts of Arable Land, in one or more counties in Great Britain, by an accurate analyſis of it; and who, having made a like analyſis of ſome poor land, ſhall, by comparing the component parts of each, and thereby aſcertaining the

the deficiences in the poor ſoil, improve a quantity of it, not leſs than one acre, by the addition of ſuch parts as the former experiments ſhall have diſcovered to be wanting therein, and therefore probably the cauſe of its ſterility; the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the manurings, ploughings, and crops of the improved land, be the ſame after the improvement as before; and that a minute account of the produce in each ſtate, of the weather, and of the various influencing circumſtances, together with the method made uſe of in analyſing the ſoils, be produced, with proper CERTIFICATES, and the chemical reſults of the analyſis, which are to remain the property of the Society, on or before the laſt Tueſday in November, 1793.

It is expected that a quantity, not leſs than ſix pounds, of the rich, of the poor, and of the improved ſoils, be produced with the Certificates.

N. B.

N. B. Among the methods or proceſſes made uſe of by Chemiſts, and called DRY or MOIST, the latter only appears adapted to the aſcertaining the reſpective proportions of the component parts of Arable earth.—Dr. Shaw, in his Chemical Lectures; Dr. Home, in his Principles of Agriculture; Dr. George Fordyce, in his Elements of Agriculture; and Sir Torbern Bergmen, in his "Diſſertation ſur les Terres Géoponiques;" have treated of theſe ſubjects.

124. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the laſt Tueſday in November, 1794.

125. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the laſt Tueſday in November, 1795.

126. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the laſt Tueſday in November, 1796.

127. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the laſt Tueſday in November, 1797.

128. DRAINING LAND. To the perſon who, in the year 1793, ſhall make the greateſt number of yards, not fewer than one thouſand, of Hollow Drain, of brick, ſtone, or ſuch like durable materials, for the improvement of land injured by water ariſing from internal ſprings; the GOLD MEDAL or THIRTY GUINEAS.

Particular accounts of the nature, quality, ſpontaneous produce, and yearly value of the Land before draining, and the ſuppoſed value afterwards; the nature and texture of the under-ſtrata whence the ſprings ariſe; the depth and width of the drains; the quantity of ſuppoſed water diſcharged,

charged, the expence of labour and materials per yard, in length, when finiſhed; a ſketch or plan of all the drains, and their ſeveral inclinations and diſtances from each other; with CERTIFICATES of the number of acres drained, and that the land was actually wet and ſpringy before draining, but dry and firm afterwards; to be produced to the Society on or before the third Tueſday in February, 1794.

129. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the third Tueſday in February, 1795.

130. IMPROVING LAND LYING WASTE. For the beſt Account of a method of improving any of the following ſoils, being land lying waſte or uncultivated, viz. Clay, Gravel, Sand, Chalk, Moor or Peat-earth, and Bog; verified by experiments on not leſs than fifty acres of land; to be produced on or before the ſecond Tueſ-

day in December, 1793; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS for each.

131. For the next greateſt quantity of land, not leſs than twenty-five acres, the SILVER MEDAL and TEN GUINEAS.

The ſoil, manner of improvement, expence, and product, are required to be fully explained.

132, 133. The ſame premiums are extended one year further.

The ACCOUNTS to be produced on or before the ſecond Tueſday in December, 1794.

134, 135. The ſame premiums are extended one year further.

The ACCOUNTS to be produced on or before the ſecond Tueſday in December, 1795.

136. MANURES. For the moſt ſatisfactory ſet of experiments, to aſcertain the comparative advantages of the following

ing Manures, uſed as Top-dreſſings, on Graſs or Corn Land, viz. Soot, Coal-Aſhes, Wood-Aſhes, Lime, Gypſum, Night-ſoil; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS.

It is required that not leſs than half an acre of land be appropriated to each Manure, the ſoils ſimilar, and lying near each other; and if the Manure be uſed on Corn Land, then it is required that the ſame kind of Grain be ſown the ſame year on each ſpot; the experiments to be continued not leſs than two years.

An ACCOUNT of the nature of the ſoil, quantity and expence of the Manure, and Crops, with CERTIFICATES, to be produced on or before the firſt Tueſday in December, 1793.

137. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in February, 1794.

It is required that the above experiments be made between two or more of the above-mentioned Manures, and that not leſs than two acres of land be dreſſed with each Manure. An account of the nature of the ſoil, quantity and expence of the Manure, and crops, with CERTIFICATES, to be produced on or before the laſt Tueſday in February, 1794.

131. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the laſt Tueſday in February, 1795.

139. IMPROVING WASTE MOORS. For the improvement of the greateſt number of acres of Waſte Moor-Land, not leſs than one hundred, the GOLD MEDAL.

It is required that the land before improvement be abſolutely uncultivated, and in a great meaſure uſeleſs; that in its improved ſtate it be incloſed, cultivated, and divided into fields, ſufficient for the uſe and occupation of a tenant.

CERTI-

CERTIFICATES of the number of acres, of the quality of the Moor ſo improved, of the mode and expence of the improvement, the ſtate it is in as to the proportion of graſs to arable, and the average value thereof, to be produced on or before the firſt Tueſday in February, 1794.

140. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1795.

141. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1796.

142. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1797.

143. GAINING LAND FROM THE SEA. To the perſon who ſhall produce to the Society an account of the beſt method, verified by actual experiment, of gaining Land from the Sea, not leſs than twenty acres, on the coaſt of England or Wales, the GOLD MEDAL.

CERTIFICATES of the quantity of Land, and that the experiments were begun after the firſt of January, 1788, to be produced to the Society on or before the firſt Tueſday in October, 1793.

N. B. The Society have been credibly informed, that land has been gained on the coaſt of Holland, by fixing rows of whiſps of ſtraw upright in the ſand, at about a foot diſtant from each other, or by fixing ſtakes at proper diſtances from each other, and wattling ſtraw-bands between them.

144. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1794.

145.

145. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1795.

146. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1796.

147. MACHINE TO ANSWER THE PURPOSE OF REAPING OR MOWING CORN. For inventing a Machine to anſwer the purpoſe of mowing or reaping Wheat, Rye, Barley, Oats, or Beans, by which it may be done more expeditiouſly and cheaper than by any method now practiſed, provided it does not ſhed the Corn or Pulſe more than the methods in common practice, and that it lays the ſtraw in ſuch a manner as that it may be eaſily gathered up for binding; TEN GUINEAS.

The

The MACHINE, with CERTIFICATES that at leaſt three acres have been cut by it, to be produced to the Society on or before the ſecond Tueſday in December, 1793.

Simplicity and cheapneſs in the conſtruction will be conſidered as principal parts of its merit.

148. IMPROVED HOE. To the perſon who ſhall produce to the Society the moſt improved or beſt-conſtructed Horſe or Hand Hoe, ſuperior to any hitherto in uſe, for the purpoſe of clearing from weeds, and looſening the Soil in, the intermediate ſpaces of all Crops of Corn ſown in equidiſtant rows, and which ſhall earth up the young plants at the ſame time; the GOLD MEDAL, or TWENTY GUINEAS.

A HOE, with CERTIFICATES of its having been ſucceſsfully uſed, to be produced to the Society on or before the firſt Tueſday in December, 1793.

149. The ſame premium is extended one year further.

The

The HOE, with CERTIFICATES, to be produced on or before the firſt Tueſday in December, 1794.

150. DESTROYING THE GRUB OF THE COCKCHAFER. To the perſon who ſhall diſcover to the Society an effectual method, verified by repeated and ſatisfactory trials, of deſtroying the Grub of the Cockchafer, or of preventing or checking the deſtructive effects which always attend Corn, Peas, Beans, and Turneps, when attacked by thoſe inſects; the SILVER MEDAL and TEN GUINEAS.

The ACCOUNTS to be produced on or before the firſt Tueſday in January, 1794.

151. DESTROYING THE WIRE-WORM. To the perſon who ſhall diſcover to the Society an effectual method, verified by repeated and ſatisfactory trials, of deſtroying the inſect called the Wire-worm, or of preventing or checking the deſtructive effects which always attend Corn, Beans, Peas, or Pulſe, when attacked by thoſe inſects;

ſects; the SILVER MEDAL and TEN GUINEAS.

The ACCOUNTS to be produced to the Society on or before the firſt Tueſday in January, 1794.

152. DESTROYING THE FLY ON HOPS AND CATERPILLARS ON FRUIT-TREES AND CULINARY PLANTS. To the perſon who ſhall diſcover to the Society an eaſy and efficacious method of deſtroying the Fly on Hops, and Caterpillars on Fruit-trees and Culinary Plants, ſuperior to any hitherto known or practiſed, the GOLD MEDAL, or THIRTY POUNDS.

ACCOUNTS, and CERTIFICATES that the method has been effectually practiſed on not leſs than ſix acres of Hop Ground, or an Orchard or Garden of not leſs than two acres, to be delivered to the Society on or before the firſt Tueſday in February, 1794.

153. CURE OF THE ROT IN SHEEP. To the perſon who ſhall diſcover

cover to the Society the beſt and moſt effectual method of curing the diſeaſe called the Rot in Sheep, verified by repeated and ſatisfactory experiments, the GOLD MEDAL, or THIRTY POUNDS.

It is expected that the candidates furniſh accurate accounts of the nature, ſymptoms, and cure of the diſeaſe, together with the imputed cauſe thereof, and the actual or probable means of prevention, which, with proper CERTIFICATES, muſt be delivered to the Society on or before the firſt Tueſday in February, 1794.

154. PREVENTING AND CURING THE ILL EFFECTS OF THE FLY ON SHEEP. To the perſon who ſhall diſcover to the Society the moſt effectual method of preventing and curing the ill effects of the Fly on Sheep, the SILVER MEDAL, or TWENTY GUINEAS.

It is required that the method be aſcertained by repeated experiments, and that a CERTIFICATE of its efficacy be delivered the

the Society on or before the firſt Tueſday in December, 1793.

155. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in December, 1794.

Premiums

Premiums for Diſcoveries and Improvements in Chemiſtry, Dying, and Mineralogy.

156. KELP. For the greateſt quantity, not leſs than four tons, of Kelp, containing a much larger proportion of Alkaline Salt than any Kelp now made for ſale, TWENTY POUNDS.

A ſpecimen of one hundred weight to be produced on or before the firſt Tueſday in January, 1794; together with CERTIFICATES that the whole quantity is equal to the ſpecimen, and made in Great Britain or Ireland of Sea-weed.

157. BARILLA. For the greateſt quantity of merchantable Barilla, not leſs than half a ton, made from Spaniſh Kali, or any other plant raiſed in Great Britain, the GOLD MEDAL.

A Sample of not leſs than twenty-eight pounds, with a CERTIFICATE that half a ton has been made, to be produced on or before the firſt Tueſday in January, 1794.

150.

158. PRESERVING SEEDS OF VEGETABLES. For the beſt method of preſerving the Seeds of Plants in a ſtate fit for vegetation a longer time than has hitherto been practiſed, ſuch method being ſuperior to any known to the public, and verified by ſufficient trial; to be communicated to the Society on or before the firſt Tueſday in December, 1793; the GOLD MEDAL.

159. METHOD OF SEPARATING THE SACCHARINE SUBSTANCE OF TREACLE IN A SOLID FORM. To the perſon who ſhall diſcover to the Society the beſt method of ſeparating the Saccharine Subſtance of Treacle in a ſolid form, at ſuch an expence as will render it advantageous to the public, the GOLD MEDAL, or FIFTY POUNDS.

A quantity of the Saccharine Subſtance, ſo ſeparated, in a ſolid form, not leſs than thirty pounds weight, with an account of the proceſs, and CERTIFICATES that not leſs than one hundred weight has been prepared,

to

to be produced to the Society on or before the firſt Tueſday in February, 1794.

The ſame premium is extended one year further.

SAMPLES and CERTIFICATES to be produced to the Society on or before the firſt Tueſday in February, 1795.

161. PRESERVING FRESH WATER SWEET. To the perſon who ſhall produce to the Society the beſt account, verified by ſatisfactory trials, of an efficacious method of preſerving Freſh-Water ſweet during long voyages; the GOLD MEDAL, or FIFTY POUNDS.

ACCOUNTS and full deſcriptions of the methods made uſe of, in order that it may be known that nothing injurious enters therein, to be produced to the Society, with at leaſt thirty gallons of Water ſo preſerved, and proper CERTIFICATES, on or before the laſt Tueſday in December, 1793.

162. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the laſt Tueſday in December, 1794.

163. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in December, 1795.

164. DESTROYING SMOKE. For the beſt account, aſcertained by proper experiments, of a method of deſtroying or burning the Smoke of fires belonging to Steam-Engines, Furnaces, employed in calcining or ſmelting Metals, or other large works, in order to prevent annoyance to the neighbourhood; to be produced on or before the firſt Tueſday in January, 1794; the GOLD MEDAL.

165. The ſame premium is extended one year further.

The

The ACCOUNTS to be produced on or before the firſt Tueſday in January, 1795.

166. CONDENSING SMOKE. To the perſon who ſhall invent the beſt method by which the Smoke of Steam-Engines, Brew-houſes, Sugar-houſes, or Furnaces, may be advantageouſly condenſed and collected in the form of Tar, or ſome other uſeful material; the GOLD MEDAL, or FIFTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES of the method having been ſucceſsfully employed, and ſpecimens of the materials produced, to be delivered to the Society on or before the firſt Tueſday in December, 1793.

167, The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in December, 1794.

168. CANDLES FROM RESIN. To the perſon who ſhall diſcover to the Society the beſt method of ſo reducing the inflammable quality of Reſin, as to adapt it to the purpoſes of making Candles fit for common uſe, at a price much inferior to that of Candles made of Tallow only; the GOLD MEDAL, or THIRTY GUINEAS.

Six pounds at leaſt of the Candles ſo prepared, with an ACCOUNT of the proceſs, to be delivered to the Society on or before the firſt Tueſday in December, 1793.

169. REFINING FISH-OIL. For diſcloſing to the Society an effectual method of purifying Fiſh-Oil from the glutinous matter that encruſts the wicks of lamps and extinguiſhes the light, though fully ſupplied with oil; the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the whole of the proceſs be fully and fairly diſcloſed, in order that

that ſatisfactory experiments may be made by the Society, to determine the validity of the claim; and that CERTIFICATES that not leſs than twenty gallons have been purified according to the proceſs delivered in, muſt, together with two gallons of the Oil in its unpurified ſtate, and two gallons ſo refined, be produced to the Society on or before the ſecond Tueſday in February, 1794.

170. The ſame premium is extended one year further.

CERTIFICATES and Samples to be produced on or before the ſecond Tueſday in February, 1795.

171. CLEARING FEATHERS FROM THEIR ANIMAL OIL. To the perſon who ſhall diſcover to the Society the beſt and moſt expeditious method, ſuperior to any hitherto practiſed, of clearing feathers from their offenſive animal oil, for the uſe of upholders in making beds, cuſhions, &c. FORTY GUINEAS.

A quantity of Feathers ſo cleared, not leſs than twenty pounds weight, with a full account of the proceſs, to be produced to the Society, on or before the firſt Tueſday in February, 1794.

172. SUBSTITUTE FOR, OR PREPARATION OF, YEAST. For diſcovering to the Society an effectual Subſtitute for Yeaſt, or preparation of Yeaſt, which, after being kept ſix months, ſhall be fit for fermenting liquors, and raiſing bread; the GOLD MEDAL, or THIRTY POUNDS.

Specimens of the Subſtitute, or of the preparation of Yeaſt, ſufficient for trials, together with a paper ſealed up, and containing an account of the compoſition of the Subſtitute, or method of preparing the Yeaſt, to be produced on or before the laſt Tueſday in November, 1793.

173. SECURING EMPTY CASKS FROM BECOMING MUSTY OR STINKING. To the perſon who ſhall diſcover

diſcover to the Society the beſt, cheapeſt, and moſt efficacious method of ſecuring empty Caſks from becoming muſty or ſtinking; the GOLD MEDAL, or THIRTY POUNDS.

A full deſcription of the method, with proper CERTIFICATES that it has been efficaciouſly practiſed, to be delivered to the Society on or before the firſt Tueſday in February, 1794.

174. PRESERVING SALTED PROVISIONS FROM BECOMING RANCID OR RUSTY. To the perſon who ſhall diſcover to the Society the beſt, cheapeſt, and moſt efficacious method of preſerving Salted Proviſions from growing rancid or ruſty; the GOLD MEDAL, or THIRTY POUNDS.

A full deſcription of the method, with proper CERTIFICATES that it has been found, on repeated trials, to anſwer the purpoſe intended, to be produced to the Society on or before the firſt Tueſday in February, 1794.

175. The ſame premium is extended one year further.

The ACCOUNT and CERTIFICATES to be produced to the Society on or before the firſt Tueſday in February, 1795.

176. INCREASING STEAM. To the perſon who ſhall diſcover to the Society a method, verified by actual experiments, of increaſing the quantity or the force of Steam, in Steam-Engines, with leſs fuel than is uſually employed, provided that in general the whole amount of the expences in uſing Steam-Engines may be conſiderably leſſened; the GOLD MEDAL, or THIRTY GUINEAS.

To be communicated to the Society on or before the firſt Tueſday in January, 1794.

N. B. As it is well known there are methods of preventing the ebullition of liquids by the addition of particular matters in the boiling, it is ſubmitted to the conſideration of the ingenious, whether, by the addition

addition of ſome matters, or by ſome mechanical operations, the boiling and evaporation may not be increaſed.

177. The ſame premium is extended one year further.

To be communicated to the Society on or before the firſt Tueſday in January, 1795.

178. PREVENTING THE DRY-ROT IN TIMBER. To the perſon who ſhall diſcover to the Society the cauſe of the Dry-Rot in Timber, and diſcloſe a certain method of prevention ſuperior to any hitherto known; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS of the cauſe, and method of prevention, confirmed by repeated experiments, to be produced to the Society on or before the ſecond Tueſday in December, 1793.

179. The ſame premium is extended one year further.

The

The ACCOUNTS to be produced on or before the ſecond Tueſday in December, 1794.

180. FINE BAR-IRON. To the perſon, in England or Wales, who ſhall make, in the year 1792, the greateſt quantity of Bar-Iron, not leſs than ten tons, with Coak, from Coak Pigs, equal in quality to the beſt Iron imported from Sweden or Ruſſia, and as fit for converting into Steel; the GOLD MEDAL.

SAMPLES, not leſs than one hundred weight, with CERTIFICATES that the whole quantity is of equal quality, to be produced to the Society on or before the firſt Tueſday in January, 1794.

181. The ſame premium is extended one year further.

SAMPLES and CERTIFICATES to be delivered on or before the firſt Tueſday in January, 1795.

182.

182. METHOD OF PREPARING WHITE LEAD, WHICH SHALL NOT BE PREJUDICIAL. To the perſon who ſhall diſcover to the Society a method of preparing White Lead, in a manner that ſhall not be prejudicial to the health of the workmen employed either in making or uſing it, and will anſwer all the purpoſes for which White Lead is at preſent uſed; FIFTY POUNDS.

A quantity of the White Lead ſo prepared, with an account of the proceſs made uſe of, and CERTIFICATES that not leſs than one ton has been manufactured in the ſame manner, to be produced to the Society on or before the ſecond Tueſday in November, 1793.

183. SUBSTITUTE FOR THE BASIS OF PAINT. To the perſon who ſhall produce to the Society the beſt Subſtitute, ſuperior to any hitherto known, for the Baſis of Paint, equally proper for the purpoſe as the White Lead now employed; ſuch

ſuch ſubſtitute not to be of a noxious quality, and which may be afforded at a price not materially higher than that of White Lead; THIRTY POUNDS.

A quantity of the Subſtitute, not leſs than fifty pounds weight, with an ACCOUNT of the proceſs uſed in preparing it, and CERTIFICATES that at leaſt five hundred weight has been manufactured, to be produced to the Society on or before the ſecond Tueſday in November, 1793.

184. The ſame premium is extended one year further.

CERTIFICATES and ACCOUNTS to be produced on or before the ſecond Tueſday in November, 1794.

185. REFINING BLOCK TIN. To the perſon who ſhall diſcover to the Society the beſt method of purifying or refining *Block Tin*, in ſuch manner as to render it fit for the finer purpoſes to which *Grain Tin* is now ſolely applied, and at an expence that ſhall not render it higher in price than *Grain*

Grain Tin; the GOLD MEDAL, or FIFTY POUNDS.

CERTIFICATES that not leſs than three tons have been refined or purified, with a full detail of the proceſs, and a quantity, not leſs than one hundred weight, of the Tin ſo refined, to be produced to the Society on or before the firſt Tueſday in November, 1793.

186. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1794.

187. GLAZING EARTHEN WARE WITHOUT LEAD. To the perſon who ſhall diſcover to the Society the cheapeſt, ſafeſt, moſt durable, and moſt eaſily fuſible Compoſition, fit for the purpoſe of glazing the ordinary kinds of Earthen Ware, without any preparation of Lead, and preferable to any hitherto in uſe; the GOLD MEDAL, or THIRTY POUNDS.

SPECIMENS

SPECIMENS of the Ware ſo glazed, with proper CERTIFICATES of its having ſucceeded, with a SAMPLE of the materials made uſe of, to be produced to the Society on or before the firſt Tueſday in February, 1794.

Premiums

Premiums for promoting the Polite Arts.

188. HONORARY PREMIUMS FOR DRAWINGS. For the beſt Drawing of any kind, made with Crayons, Chalk, Black Lead, Pen, Indian Ink, or Biſter, by young Gentlemen under the age of twenty-one, ſons or grandſons of Peers, or Peereſſes in their own right, of Great Britain or Ireland, to be produced on or before the firſt Tueſday in March, 1794; the HONORARY MEDAL of the Society IN GOLD.

189. The ſame IN SILVER, for the ſecond in merit.

190, 191. The ſame premiums will be given, on the like conditions, to young Ladies, daughters or grand-daughters of Peers, or Peereſſes in their own right, of Great-Britain or Ireland.

192. HONORARY PREMIUMS FOR DRAWINGS. For the beſt Drawing of any kind, made with Crayons, Chalk, Black Lead, Pen, Indian Ink, or Biſter, by young Gentlemen under the age of twenty-one; to be produced on or before the firſt Tueſday in March, 1794; the GOLD MEDAL.

193. For the next in merit, the SILVER MEDAL.

194, 195. The ſame premiums will be given for Drawings by young Ladies.

N. B. As the foregoing Honorary Premiums are intended only for ſuch of the Nobility and Gentry as may hereafter become patrons or patroneſſes of the Arts; perſons profeſſing any branch of the Polite Arts, or any buſineſs dependent on the Arts of Deſign, or the ſons or daughters of ſuch perſons, will not be admitted Candidates in theſe Claſſes.

The two following Premiums (Claſſes 196 *and* 197*) are offered in conformity to the Will of the late John Stock, of Hampſtead, Eſq.*

196. DRAWING. For the beſt Drawing, in Indian Ink, of the Equeſtrian Statue of King Charles the Firſt, at Charing-Croſs, not leſs than eighteen inches high, to be produced on or before the third Tueſday in February, 1794, a SILVER MEDALLION, with the following engraved inſcription: *The Premium given by the Society for the Encouragement of Arts, Manufactures, and Commerce, in conformity to the Will of John Stock, of Hampſtead, Eſq. and Five Guineas, in conſideration of the Drawing being left with the Society as their property.*

197. PORTRAIT. For the beſt Copy, in Oil-Colours, of a Portrait of the late

JOHN STOCK, of Hampſtead, Eſq. to be produced on or before the third Tueſday in February, 1794, a SILVER MEDALLION, with the following engraved inſcription: *The Premium given by the Society for the Encouragement of Arts, Manufactures, and Commerce, in conformity to the Will of John Stock, of Hampſtead, Eſq.*

198. DRAWINGS OF OUTLINES. For the beſt Outline, after an original group or caſt, in plaſter, of Human Figures, by perſons of either ſex, under the age of ſixteen, the principal figure not leſs than twelve inches; to be produced on or before the third Tueſday in February, 1794; the greater SILVER PALLET.

199. For the next in merit, the leſſer SILVER PALLET.

N. B. Theſe drawings are to be made on Paper, with Chalk, Black Lead, Indian Ink, or Biſter; and the original either to be

be produced to the Society, or to be referred to for their examination.

200. DRAWINGS OF MACHINES, For the beſt Perſpective Drawing, by perſons of either ſex under the age of twenty-one years, of the Spinning and Winding Machine, by Mr. Burt, in the Society's Repoſitory, the greater SILVER PALLET; to be produced on or before the third Tueſday in February, 1794.

N. B. Such Candidates as propoſe to make Drawings for this Premium, will be admitted by the Regiſter any day (Sundays and Wedneſdays excepted), between the hours of ten and two.

The Drawing to which the premium is adjudged, is to remain the property of the Society.

201. DRAWINGS OF LANDSCAPES. For the beſt Drawing of a Landſcape after nature, by perſons of either ſex under twenty-one years of age, to be produced on or before the third Tueſday

in February, 1794, the greater SILVER PALLET.

202. For the next in merit, the leſſer SILVER PALLET.

Each Candidate muſt mention, on the front of the Drawing, from whence the View was taken; and the Drawings muſt be made with Chalk, Pen, Indian Ink, Water-Colours, or Biſter.

203. HISTORICAL DRAWINGS. For the beſt Hiſtorical Drawing, being an original compoſition, of five or more Human Figures; the height of the principal figure not leſs than eight inches; to be made with Crayons, Chalk, Black Lead, Pen, Indian Ink, Water-colours, or Biſter, and to be produced on or before the third Tueſday in February, 1794; the GOLD PALLET.

204. For the next in merit, the greater SILVER PALLET.

205. SURVEYS OF COUNTIES. To the perſon who, in the year 1792, ſhall complete

complete and publiſh an accurate Survey of any one County in England or Wales, on a ſcale of not leſs than one inch to a mile, for which rewards have not already been given by the Society; the GOLD MEDAL, or FIFTY POUNDS.

CERTIFICATES of the accuracy of the Survey, and that it was begun after the firſt of June, 1789, together with the Map, to be produced on or before the laſt Tueſday in January, 1794.

The Map to which the premium ſhall be adjudged, to remain the property of the Society.

N. B. The Society are already in poſſeſſion of Surveys of the following Counties, viz. Devonſhire, Derbyſhire, Somerſetſhire, Northumberland, Suffolk, Leiceſterſhire, Cumberland, Lancaſhire, Dorſetſhire, and Hampſhire.

206. The ſame premium is extended one year further.

The Survey to be begun after the firſt of June, 1790; and the Map to be produced

on or before the laſt Tueſday in January, 1795.

207. The ſame premium is extended one year further.

The Survey to be begun after the firſt of June, 1791; and the Map to be produced on or before the laſt Tueſday in January, 1796.

208. The ſame premium is extended one year further.

The Survey to be begun after the firſt of June, 1792; and the Map to be produced on or before the laſt Tueſday in January, 1797.

209. NATURAL HISTORY. To the Author who ſhall publiſh, in the year 1793, the Natural Hiſtory of any County of England or Wales, the GOLD MEDAL, or FIFTY POUNDS.

It is required that the ſeveral natural productions, whether animal, vegetable, or mineral, peculiar to the county, or found therein, be carefully and ſpecifically arranged

ranged and deſcribed, in order that the Public may be enabled to judge what Arts or Manufactures are moſt likely to ſucceed in ſuch County.

The Work to be delivered to the Society on or before the laſt Tueſday in January, 1794.

210. The ſame premium is extended one year further.

The Work to be delivered to the Society on or before the laſt Tueſday in January, 1795.

211. The ſame premium is extended one year further.

The Work to be delivered to the Society on or before the laſt Tueſday in January, 1796.

CONDITIONS.

No perſon who has gained the firſt Premium in any Claſs, will be admitted a Candidate in a Claſs of an inferior age; and no Candidate ſhall receive more than one Premium in one year; nor will they who for two ſucceſſive years ſhall gain the firſt Premium in one Claſs, be ever again admitted as Candidates in that Claſs.

No perſon ſhall ever be admitted a Candidate in any Claſs, in which he has three times obtained the whole of the firſt Premium.

No Candidate ſhall ſend in more than one Performance in any one Claſs.

All the Claims which are produced each year before the Committee of Polite Arts (to which Premiums or Bounties are adjudged) are to remain with the Society ſix weeks after the determination, unleſs the Candidates, for particular reaſons, do apply to have their performances returned.

No Claim for a Premuium in the Polite Arts will be admitted, that has obtained

tained, or has been produced in order to obtain, a Premium, Reward, or Gratification, from any other Society, or any Academy or School.

All Performances that obtain Premiums in the Polite Arts, muſt be begun after the publication of ſuch Premiums.

Purpoſely to encourage real merit, and to prevent any attempts to impoſe on the Society, by producing Drawings which ſhall have been made or retouched by any other perſon than the Candidate, the Society is reſolved, upon all occaſions, with reſpect to the ſucceſsful Candidates in Claſſes 187 to 192 incluſive, to prove their abilities, by requiring a ſpecimen made under the inſpection of the Committee of Polite Arts, in every inſtance where ſuch proof can be obtained.

It is required that all Candidates in the Polite Arts do ſignify on their Drawings, their age, and whether the performances are originals, or copies, and, if copies, whence they were taken.

Premiums

Premiums for encouraging and improving Manufactures.

212. SILK. For the greateſt quantity of merchantable Silk, not leſs than ten pounds weight, produced by any one perſon in England, in the year 1793, the GOLD MEDAL.

SPECIMENS of the SILK, not leſs than one pound, with CERTIFICATES that the whole is of equal quality, and produced in England, to be delivered to the Society on or before the firſt Tueſday in January, 1794.

213. For the ſecond greateſt quantity, not leſs than five pounds weight, the SILVER MEDAL.

214, 215. The ſame premiums are extended one year further.

The Specimens and Certificates to be delivered to the Society on or before the firſt Tueſday in January, 1795.

216. MACHINE FOR CARDING SILK. For the beſt Machine, ſuperior to any now in uſe, for carding Waſte Silk equally well as by hand; to be produced, together with a ſpecimen of the Cardings, on or before the firſt Tueſday in November, 1793; the GOLD MEDAL, or TWENTY POUNDS.

217. WEAVING FISHING-NETS. For the beſt ſpecimen of Plain Netting, for Fiſhing-Nets, ſuperior to any hitherto in uſe, not leſs than twenty yards long, and ſix feet deep, woven in a Loom, or other Machine; to be produced to the Society on or before the ſecond Tueſday in January, 1794; FIFTY GUINEAS.

N. B. It is expected that the Specimen produced be made in ſuch a manner, as to be cut and joined without more loſs than uſual, that it have ſuch a plain ſelvage as the common Fiſhing-Nets, and that the Knot be equally faſt with thoſe in Nets in common uſe, and as eaſily repaired.

218.

218. CLOTH FROM HOP-STALKS OR BINES. To the perſon who ſhall produce to the Society the greateſt quantity, not leſs than thirty yards, of Cloth, at leaſt twenty-ſeven inches wide, made in England or Wales of Hop-Stalks or Bines, and ſuperior to any hitherto manufactured in England of that material, the GOLD MEDAL, or THIRTY POUNDS.

One pound of the Thread of which the Cloth is made, and thirty yards of the Cloth, together with proper CERTIFICATES that the whole is manufactured from Hop-Stalks or Bines, to be produced to the Society on or before the ſecond Tueſday in December, 1793.

N. B. The Society are already in poſſeſſion of Cloth made in England from Hop-Stalks or Bines, which may be inſpected by application to the Regiſter.

219. WICKS FOR CANDLES OR LAMPS. To the perſon who ſhall diſcover to the Society a method of manufacturing

turing Hop-Stalks or Bines, ſo as to render them fit for the purpoſe of ſupplying the place of Cotton, for Wicks of Candles or Lamps, TWENTY GUINEAS.

SAMPLES, not leſs than five pounds weight, of the Wicks, ſo prepared, to be produced to the Society, with CERTIFICATES that the whole quantity is made from Hop-Stalks or Bines, on or before the ſecond Tueſday in January, 1794.

220. The ſame premium is extended one year further.

SAMPLES and CERTIFICATES to be produced on or before the ſecond Tueſday in January, 1795.

221. PAPER FROM RAW VEGETABLE SUBSTANCES. To the perſon in England or Wales who ſhall make the greateſt quantity, not leſs than ten reams, of the beſt and moſt uſeful Paper, from Raw Vegetable Subſtances, TWENTY GUINEAS.

CERTIFICATES of the making ſuch Paper, and one ream of the Paper, to be produced

produced on or before the firſt Tueſday in November, 1793.

N. B. The Society are in poſſeſſion of two volumes, containing a great variety of ſpecimens of Paper made from Raw Vegetables, viz. Thiſtles, Potatoe-Haum, Poplar, Hop-bines, &c. which volumes may be inſpected by any perſon, on application to the Regiſter.

222. MAINTAINING AND EMPLOYING THE POOR. To the perſon who ſhall produce to the Society, the beſt practical and moſt œconomical Plan for the maintenance and employment of the Poor in Pariſh Workhouſes, ſuperior to any hitherto generally known, the GOLD MEDAL, or FIFTY POUNDS.

The Plans to be delivered to the Society on or before the firſt Tueſday in March, 1794.

Premiums

Premiums for Invention in Mechanicks.

223. TRANSIT INSTRUMENT. To the perſon who ſhall invent and produce to the Society a cheap and portable Tranſit Inſtrument, which may eaſily be converted into a Zenith Sector, capable of being accurately and expeditiouſly adjuſted for the purpoſes of finding the Latitudes and Longitudes of places, and ſuperior to any portable Tranſit Inſtrument now in uſe, the GOLD MEDAL, or FORTY GUINEAS.

To be produced on or before the laſt Tueſday in January, 1794.

224. GUN FOR THROWING HARPOONS. To the perſon who ſhall produce to the Society the beſt improvement in the conſtruction of a Gun for throwing Harpoons, ſo as to render it more manageable than thoſe at preſent in uſe,

uſe, the SILVER MEDAL, and TWENTY GUINEAS.

The GUN to be produced to the Society on or before the firſt Tueſday in December, 1793.

225. TAKING WHALES BY THE GUN-HARPOON. To the perſon who, in the year 1793, ſhall ſtrike the greateſt number of Whales, not fewer than three, with the Gun-Harpoon, TEN GUINEAS.

Proper CERTIFICATES of the ſtriking ſuch Whales, and that they were actually taken in the year 1793, ſigned by the Maſter, or by the Mate when the Claim is made by the Maſter, to be produced to the Society on or before the laſt Tueſday in December, 1793.

226. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1794.

227.

227. DRIVING BOLTS INTO SHIPS. To the perſon who ſhall invent and produce to the Society a Model, ſhewing a method of driving Bolts into Ships, particularly thoſe of Copper, without ſplitting the Head or bending them, with more diſpatch, in all directions, and tighter, than by any means hitherto known or in uſe, THIRTY GUINEAS.

The Model to be produced to the Society on or before the firſt Tueſday in February, 1794.

228. PORTABLE MACHINE FOR LOADING AND UNLOADING GOODS. To the perſon who ſhall invent and produce to the Society, the beſt, moſt ſimple, and portable Machine, ſuperior to any hitherto known, or in uſe, for the purpoſe of loading and unloading goods; the GOLD MEDAL, or FORTY GUINEAS.

The machine to be delivered to the Society on or before the firſt Tueſday in January, 1794.

229. METAL ROPE OR CHAIN. To the perſon who ſhall have invented a Chain or Rope of Copper, or other Metal, ſuperior to any hitherto made, ſufficiently flexible to work well, and IN ALL DIRECTIONS, over pullies, and which ſhall ſerve every purpoſe of a good Hempen Rope of at leaſt two inches diameter, FIFTY POUNDS.

The Candidate to produce to the Society ſatisfactory CERTIFICATES that ſuch Metal Rope or Chain has been uſed to advantage in manufactories, or large works, where Hempen Ropes have been hitherto employed.

The CERTIFICATES, and a Sample of the Metal Rope or Chain, not leſs than ten yards long, to be produced to the Society on or before the firſt Tueſday in November, 1793.

230.

230. HAND MILL. To the perſon who ſhall produce to the Society a better-conſtructed Hand Mill, for general purpoſes, than any now known or in uſe, the SILVER MEDAL, or TWENTY GUINEAS.

To be delivered to the Society on or before the laſt Tueſday in December, 1793.

231. MACHINE FOR RAISING COALS, ORE, &c. &c. To the perſon who ſhall invent a Machine for raiſing Coals, Ore, &c. from Mines, which ſhall produce the effect at a leſs expence than thoſe already known or in uſe, the GOLD MEDAL, or FIFTY GUINEAS.

A Model of the Machine, made on a ſcale of not leſs than one inch to a foot, to be produced to the Society on or before the ſecond Tueſday in February, 1794.

232. MACHINE FOR RAISING WATER. To the perſon who ſhall invent a Machine on a better, cheaper, and

more ſimple conſtruction than any hitherto known or in uſe, for raiſing Water out of Wells, &c. from a depth not leſs than fifty feet, FORTY GUINEAS.

CERTIFICATES of the performance of the Machine, and a Model of it, on a ſcale of not leſs than one inch to a foot, to be produced to the Society on or before the firſt Tueſday in February, 1794.

233. MACHINE FOR CLEARING RIVERS. For the beſt Model of a Machine, ſuperior to any now in uſe, for clearing Navigable Rivers from Weeds at the leaſt expence, FORTY GUINEAS.

To be produced to the Society on or before the firſt Tueſday in February, 1794.

234. METHOD OF EXTINGUISHING FIRES. To the perſon who ſhall produce to the Society, the moſt ſpeedy and effectual method of extinguiſhing Fires in houſes or other buildings, ſuperior to any hitherto known or in uſe, the GOLD MEDAL, or FIFTY GUINEAS.

To

To be produced on or before the ſecond Tueſday in February, 1794.

235. IMPROVEMENT OF WHEEL-CARRIAGES. To the perſon who ſhall diſcover to the Society the principles, and point out the conſtruction, upon which Wheel Carriages may be drawn with the leaſt fatigue to the horſe or horſes employed, the GOLD MEDAL, or FIFTY POUNDS.

The CLAIMS to be delivered to the Society on or before the ſecond Tueſday in December, 1793.

Premiums offered for the Advantage of the Britiſh Colonies.

236. NUTMEGS. For the greateſt quantity of merchantable Nutmegs, not leſs than ten pounds weight, being the growth of his Majeſty's dominions in the Weſt Indies, and equal to thoſe imported from the Iſlands of the Eaſt Indies, the GOLD MEDAL, or ONE HUNDRED POUNDS.

Satisfactory CERTIFICATES, from the Governor, or Commander in Chief, of the place of growth, with an account of the number of trees, their age, nearly the quantity of fruit on each tree, and the manner of culture, to be produced on or before the firſt Tueſday in December, 1793.

237. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in December, 1794.

N.B.

N. B. Any perſon deſirous of information on the ſubject of Nutmeg-trees, may obtain it from a Memorial on the Fructification of the Nutmeg, and the ſureſt method of cultivating it to advantage, by the King's Gardener at the Iſle of Bourbon, inſerted in Mr. Maty's Review for Auguſt, 1783.

238. CINNAMON. For importing into the port of London, in the year 1793, the greateſt quantity, not leſs than twenty pounds weight, of Cinnamon, being the growth of ſome of the Iſlands in the Weſt Indies belonging to the Crown of Great Britain, and equal in goodneſs to the Cinnamon brought from the Eaſt-Indies, the GOLD MEDAL, or FIFTY POUNDS.

SAMPLES, not leſs than two pounds weight, with CERTIFICATES that the whole quantity is equal in goodneſs; together with ſatisfactory CERTIFICATES, ſigned by the Governor, or Commander in Chief, of the place of growth, with an

account of the number of trees growing on the ſpot, their age, and the manner of culture; to be produced to the Society on or before the firſt Tueſday in January, 1794.

239. The ſame premiums are extended one year further.

The SAMPLES and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1795.

240. BREAD-FRUIT TREE. To the perſon who, in the year 1793, ſhall convey from the Iſlands of the South Sea, to any of the Iſlands in the Weſt-Indies ſubject to the Crown of Great Britain, the greateſt number, not fewer than ſix, of one or both ſpecies of the Bread-fruit Tree, in a growing ſtate, the GOLD MEDAL.

CERTIFICATES, ſigned by the Governor or Commander in Chief of the Iſland, of the importation of the trees, and of the ſtate they were in at the time of ſigning ſuch Certificates, to be delivered to the Society

Society on or before the ſecond Tueſday in October, 1793.

241. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in October, 1794.

242. KALI FOR BARILLA. To the perſon who ſhall have cultivated, in the Bahama Iſlands, or any other part of his Majeſty's dominions in the Weſt Indies, in the year 1791, the greateſt quantity of land, not leſs than two acres, with Spaniſh Kali, fit for the purpoſe of making Barilla, the GOLD MEDAL.

243. For the next greateſt quantity, not leſs than one acre, the SILVER MEDAL.

CERTIFICATES, ſigned by the Governor, or Commander in Chief, for the time being, of the quantity of land ſo cultivated, and of the ſtate of the Plants at the time of ſigning ſuch Certificates, to be delivered to the

the Society on or before the ſecond Tueſday in November, 1793.

244, 245. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the ſecond Tueſday in November, 1794.

246, 247. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1795.

248. DISCOVERY OF A PASSAGE BY LAND, FROM UPPER CANADA TO THE SOUTH SEA. To the perſon who ſhall firſt diſcover and open a paſſage by land, from the north-weſt parts of Upper Canada to the South Sea, between Nootka Sound and the Straits of Kamchatka, or to the navigable part of any River that diſembogues itſelf into the South Sea within thoſe limits, the GOLD MEDAL.

Such

Such Diſcovery to be aſcertained by a CERTIFICATE under the hand and ſeal of the Governor, or Commander in Chief for the time being, of the ſaid province of Upper Canada.

249. DESTROYING THE INSECT COMMONLY CALLED THE BORER. To the perſon who ſhall diſcover to the Society an effectual method of deſtroying the Inſect commonly called the BORER, which has of late years been ſo deſtructive to the Sugar-Canes in the Weſt-India Iſlands, the GOLD MEDAL, or FIFTY POUNDS.

The Diſcovery to be aſcertained by ſatisfactory CERTIFICATE, under the hand or ſeal of the Governor or Commander in Chief for the time being, and of ſome other reſpectable perſons, inhabitants of the Iſlands in which the remedy has been ſucceſsfully applied; ſuch CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in January, 1794.

250.

251. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in January, 1795.

251. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in January, 1796.

252. BOTANIC GARDEN IN THE BAHAMA ISLANDS. To the perſon who, before the firſt of January, 1795, ſhall ſet apart, and properly fence and cultivate, the greateſt quantity of ground, not leſs than five acres, in any of the Bahama Iſlands, as a botanic garden, for the purpoſe of making experiments in the culture of thoſe articles which are the peculiar production of the tropical climates, and which may tend to promote the commerce and manufactures of this country; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

It is required that any perſon claiming the foregoing premium, ſhould produce to the

the Society, on or before the firſt Tueſday in January, 1796, a CERTIFICATE from the Governor or Commander in Chief of the Bahama Iſlands for the time being, of his having complied with the above requiſitions, and that the garden is in a proper ſtate of culture at the time of ſigning ſuch Certificate.

253. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1797.

Society's

Society's Office, Adelphi, May 22, 1793.

Ordered,

THAT THE SEVERAL CANDIDATES AND CLAIMANTS TO WHOM THE SOCIETY SHALL ADJUDGE PREMIUMS OR BOUNTIES, DO ATTEND AT THE SOCIETY'S OFFICE IN THE ADELPHI, ON THE LAST TUESDAY IN MAY, 1794, AT TWELVE O'CLOCK AT NOON, TO RECEIVE THE SAME; THAT DAY BEING APPOINTED BY THE SOCIETY FOR THE DISTRIBUTION OF THEIR REWARDS: AND BEFORE THAT TIME NO PREMIUM OR BOUNTY WILL BE DELIVERED, EXCEPTING TO THOSE WHO ARE OUT OF THE KINGDOM, OR PREVENTED BY UNAVOIDABLE ACCIDENTS.

IN CASES WHERE THE SOCIETY MAY THINK FIT TO ADMIT EXCUSES FOR NOT ATTENDING IN PERSON, DEPUTIES MAY BE SUBSTITUTED TO RECEIVE THE REWARDS, PROVIDED SUCH DEPUTIES ARE EITHER MEMBERS OF THE SOCIETY, OR THE SUPERIOR OFFICERS THEREOF.

GENERAL

GENERAL CONDITIONS.

NOTWITHSTANDING the Society reſerve to themſelves the power of giving, in all caſes, ſuch part only of any Premium as the Performance ſhall be adjudged to deſerve, or of withholding the whole, if there be no merit; yet the Candidates may be aſſured the Society will always judge liberally of their ſeveral Claims.

It is required that the matters for which Premiums are offered, be delivered in without names, or any intimation to whom they belong; that each particular thing be marked in what manner each Claimant thinks fit, ſuch Claimant ſending with it a paper ſealed up, having on the outſide a correſponding mark, and on the inſide the Claimant's name and addreſs: and all Candidates are to take notice, that no Claim for a Premium will be attended to, unleſs the conditions of the Advertiſement are fully complied with.

No.

No Papers ſhall be opened, but ſuch as ſhall gain Premiums, unleſs where it appears to the Society abſolutely neceſſary for the determination of the Claim: all the reſt ſhall be returned unopened, with the Matters to which they belong, if inquired after by the Marks, within two years; after which time, if not demanded, they ſhall be publicly burnt, unopened, at ſome meeting of the Society.

All Models of Machines, which obtain Premiums or Bounties, ſhall be the property of the Society.

All the Premiums of this Society are deſigned for that part of Great Britain called England, the dominion of Wales, and the Town of Berwick upon Tweed, unleſs expreſsly mentioned to the contrary.

The Claims ſhall be determined as ſoon as poſſible after the delivery of the ſpecimens.

No

No perſon ſhall receive any Premium, Bounty, or Encouragement, from the Society, for any matter for which he has obtained, or propoſes to obtain, a Patent.

A Candidate for a Premium, or a perſon applying for a Bounty, being detected in any diſingenuous method to impoſe on the Society, ſhall forfeit ſuch Premium or Bounty, and be deemed incapable of obtaining any for the future.

The Performances which each year obtain Premiums or Bounties, are to remain with the Society until the end of May, except as mentioned in the Conditions annexed to the Premiums offered for promoting the Polite Arts.

No Member of this Society ſhall be a Candidate for, or entitled to receive, any Premium, Bounty, or Reward whatſoever, except the Honorary Medal of the Society,

Where Certificates are required to be produced in claim of Premiums, they ſhould be expreſſed, as nearly as poſſible, in the words of the reſpective advertiſements, and ſhould not be from the Candidate (ſolely), but from ſome other perſon or perſons who have a poſitive knowledge of the facts certified.

Where Premiums or Bounties are obtained in conſequence of ſpecimens produced, the Society mean to retain ſuch part of thoſe ſpecimens as they may judge neceſſary, making a reaſonable allowance for the ſame.

No Candidates ſhall be preſent at any meetings of the Society or Committees, or admitted at the Society's Rooms, after they have delivered in their Claims, until ſuch Claims are adjudged, unleſs ſummoned by the Committee.

N. B.

N. B. Any information or advice that may forward the deſigns of this Society for the public good, will be received thankfully, and duly conſidered, if communicated by letter, addreſſed to the Society, and directed to Mr. MORE, the Secretary, at the Society's Office, in the Adelphi Buildings, London.

*** In caſe any perſon ſhould be inclined to leave a ſum of money to this Society, by will, the following form is offered for that purpoſe;

Item. I give and bequeath unto A. B. and C. D. the ſum of upon condition and to the intent that they, or one of them, do pay the ſame to the Collector for the time being, of a Society in London, who now call themſelves the Society for the Encouragement of Arts,

Manufactures, and Commerce; which ſaid ſum of I will and deſire may be paid out of my perſonal eſtate, and applied towards the carrying on the laudable deſigns of the Society.

By order of the Society,

SAMUEL MORE, Secretary.

A

LIST

OF

CONTRIBUTING MEMBERS.

N. B. Thoſe marked with ** pay Five Guineas annually; thoſe marked with * Three Guineas annually; thoſe with P are Perpetual Members; thoſe with †† have ſerved the office of Steward; and thoſe with † are Stewards elect.

A.

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Adam, William, Eſq. *ditto*

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Affleck, Admiral Philip, *Wimpole-ſtreet, Cavendiſh-ſquare*
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Clarke, Richard, Eſq. *Worceſter*
Clarke, William, Eſq. *Gracechurch-ſtreet*
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Collins, Benjamin Charles, Eſq. *Saliſbury*
Colliſon, Mr. John, *Caſhalton*
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Cox, Robert Albion, Eſq. *Little Britain*
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D.

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**Dartmouth, William, Earl of, F.R.S.

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Davenport

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Davenport, John, Esq. *John street, Adelphi*
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††Dolben, John Engliſh, Eſq. F.A.S.
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Dollond, Mr. John, *ditto*
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††Drake, William, jun. Eſq. M.P. *Portman-ſquare*
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Drake, Mr. Samuel, *Margaret-ſtreet, Weſtminſter*
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Dunnage, Mr. John, *Philpot-lane*
Dunnage, Mr. James, *ditto*
P Duroure, Lieut. Colonel, F.R. and A.S.
††*Duval, the Rev. Philip, D.D. F.R. and A.S. *Newman-ſtreet*

E.

P Egremont, George Wyndham, Earl of
P Eardley, Sampſon, Lord, M.P. F.R. and A.S.
Einſiedel, His Excellency Count
Eden, Sir John, Bart. M.P.
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Eaton, Richard, Eſq. *Lincoln's-Inn*
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Edwards, Mr. Samuel, *Stamford, Lincolnſhire*
Edwards, Mr. John, *at Mr. Wood's, No. 35, Bread-ſtreet-buildings*
P Egan, James, LL.D. *Royal-park Academy, Greenwich*
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The Plate of Mr. Quayle's Regulator, page 166.

The Plate of Mr. Johnſon's Crane, page 173.

The Plate of Captain Pakenham's Rudder, page 183.

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